THE

DENTAL COSMOS:

A

MONTHLY RECORD OF DENTAL SCIENCE.

Devoted to the Interests of the Profession.

EDITED BY

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Observe, Compare, Reflect, Record.

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THE

DENTAL COSMOS.

NEW SERIES.

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ORIGINAL COMMUNICATIONS.

CUVIERIAN CLASSIFICATION OF ANIMATED NATURE.

BY J. H. M'QUILLEN, D.D.S.

An Address delivered before the Central Massachusetts Dental Society, May 1, 1866.

(Continued from page 646, vol. vii.)

Having directed attention in a general way to the characteristic differences between inorganic and organic matter, the dependence of the latter on the former, and the constant interchange which takes place between them, the way is opened to more properly appreciate the classification of animated nature.

In every department of science, classification has two prominent purposes to subserve: first, to organize the knowledge which has been gained through the exertions of innumerable investigators by having it arranged in a methodical manner so as to render its acquisition, retention, and use most easy and successful; second, that it may be employed to facilitate identification, or the recognition of the resemblances or differences existing between facts or objects embraced in the line of study, and in that way enable observers who are familiar with the great principles underlying science and their special applications to confirm or disprove mooted points, or by the discovery of new objects or new principles to add to the general stock of knowledge. The importance and advantage of a regular and systematic arrangement of science are never more apparent than when men of fair perceptions, respectable abilities, and liberal attainments, but who lack the essential quality of an orderly arrangement of the knowledge they have acquired, attempt to present their views either as speakers or writers; for in place of offering them in a clear, connected, and comprehensive manner that would secure attention and benefit listeners or readers, they are presented in such a disjointed and incoherent way that the usefulness and efficiency of their efforts are greatly impaired. Were it not that in all ages the master-spirits of science, those broad, generalizing, and

philosophical minds, who, in addition to patient, laborious investigation on their own part, taking advantage of the recorded facts of reliable observers, have always endeavored to discover the great cardinal principles upon which science rests, and by demonstrating the existence of certain fixed laws have in this way simplified its study by arranging a number of apparently isolated facts or objects in well-defined groups, it would be impossible at the present day for any mind, however vast the power or remarkable the memory, to grasp, retain, or successfully manage such heterogeneous masses of material as would exist without classification. As SIR JOHN HERSCHEL has said, "Science is the knowledge of many, orderly and methodically arranged and digested, so as to become attainable by one." To no department does this apply with more force than to Natural History, and from the time of its founder, ARISTOTLE, naturalists, by a careful study of the resemblances and differences presented by animals, have endeavored to arrange them into well-defined groups, bringing together those which have certain marked resemblances, and separating these from others that are dissimilar to them.

In many respects, the observations and suggestions of the Greek philosopher in relation to animated nature have not been improved upon during two thousand years, but in one most important particular he made a very great mistake. Supposing that a differential characteristic existed in the presence or absence of blood, and regarding as such only that fluid which has a red color, in his first division of animals, ARISTOTLE classified them in two primary groups, as ENAIMA, sanguineous, or possessing blood, and ANAIMA, exsanguineous, or without blood. This arrangement prevailed for a long time, but eventually, when it was found that many of the latter group possessed blood, although of a different color, his divisions were still retained, but spoken of as those with "red blood" and those with "white blood." In the minute and careful dissections of the lower animals by CUVIER, he discovered red blood in some of the worms which had heretofore been regarded as only possessing white blood; this demonstrated the utter fallacy of the distinction just referred to. LAMARCK then observing that certain animals possessed a vertebral column (the backbone of common parlance), which is entirely absent in a far greater number, proposed to classify them as the VERTEBRATA and INVERTEBRATA. This classification is still employed by naturalists as a matter of convenience, but the recognition of the fact that while the first group is based upon the possession of a positive characteristic, the other is due to a negation, lessened its value, and particularly after the important discovery that the vertebral column is subordinate to a higher office than merely serving as a central axis to the skeleton, viz.: affording lodgment and protection to that important and delicate nervous mass, the spinal cord, while its expanded portion, the brain, is safely lodged in the skull. This led CUVIER to investigate the nervous system of the invertebrata, and discovering, as the result of

elaborate dissections, important modifications of that system in them, he established the four "GREAT DIVISIONS" or "SUB-KINGDOMS" of the ANIMAL KINGDOM, which are so well known, have contributed so much to facilitate the study of Natural History, and immortalize his name. His "GREAT DIVISIONS" are divisible into "CLASSES," these again into smaller groups named "ORDERS," ORDERS into "FAMILIES," FAMILIES into "GENERA," and the latter into "SPECIES."

ARISTOTLE had used GENERA and SPECIES to distinguish between larger and smaller groups; and LINNÆUS, who did much to systemize the study of animals, added to these CLASSES and ORDERS; but all these terms were employed by him in a manner that frequently induced great confusion, and it was not until the promulgation of CUVIER's plan that the classification of animated nature could be said to have a firm and reliable basis. A general idea of his system may be gained by reference to the diagram on the blackboard, which I have arranged so as to offer in a tabular or skeleton form his plan, with the modifications that appear to me to adapt it—at least to a certain degree—to the present condition of Zoology; it presents in particular that portion of the Animal Kingdom, the vertebrata, with which you are most familiar.

KINGDOMS.

MINERAL. VEGETABLE. ANIMAL.

ARCHETYPES.

VERTEBRATA. ARTICULATA. MOLLUSCA. RADIATA.

CLASSES.

PISCES. REPTILIA. AMPHIBIA. AVES. MAMMALIA.

SUB-CLASSES.

1. VIVIPARA, OR PLACENTALIA.
   - UNGUICULATA.
     - ORDERS.
     - BIMANA. QUADRUMANA. CHEIROPTERA.
     - INSECTIVORA. CARNIVORA. CETACEA.
     - RODENTIA. EDENTATA.
   - UNGULATA. PACHYDERMATA. RUMINANTIA.
2. OVOVIVIPARA. OR IMPLACENTALIA. MARSUPIATA. MONOTREMATA.

FAMILIES.

GENERA.

SPECIES.

In the construction of his classification, CUVIER was largely indebted to the labors of naturalists who had preceded or were contemporary with

him,* and it has undergone and must continue to undergo modifications and improvements on the part of subsequent observers. It is based upon the recognition of a unity of plan or conformation of structure among beings apparently dissimilar to each other. In the arrangement of the different groups advantage is taken of certain general plans of organization observable in animals; the adaptation of their bodies for swimming in the water, creeping or walking on the land, or flying in the air; the structure and peculiarities of their limbs; the form and structure of their teeth, or the absence of the latter, etc. To properly understand the classification it is necessary to take up the different groups in regular order. In describing them, a number of technical terms of necessity will have to be employed. These, however, will be carefully defined, so that persons least familiar with them may understand their meaning; in this connection it may not be amiss to state that the objections urged against the use of Greek and Latin terms in scientific nomenclature are not well founded. The aim is not to mystify, but rather to simplify science by their use; for in the employment of universal languages such as Greek and Latin, a single name applied to a given object will answer better the purpose, and be far more easy of remembrance, than to be compelled to memorize half a dozen names in as many different languages. That which the masters of science have seen fit to use, you may rest assured is right. Commencing with

KINGDOMS.

MINERALS, VEGETABLES, and ANIMALS are arranged under this head. Having already stated that these are divisible into the inorganic and organic, it is only necessary to consider the characteristic resemblances and differences between animals and vegetables. They agree in originating from parents in an *egg* or *seed*, and in the fact that the various structures which enter into their composition commence in a *cell*, and in the integrity of the organism during life, vegetable or animal, being maintained through the continuous operation of millions of these cells. In these is found that *unity of organization* which naturalists had been dreaming of and philosophizing about for ages, but which was left for SCHLEIDEN, SCHWANN, and VON BAER to discover and demonstrate in our own day.

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* In the preface to the first edition of CUVIER'S great work, THE ANIMAL KINGDOM, he says: "Had I been constrained to depend upon myself alone, I should not have been able to prepare even the simple sketch I now give; but the resources of my position seemed to me to supply what I wanted both of time and talent. Living in the midst of so many able naturalists, drawing from their works as fast as they appeared, enjoying the use of their collections as freely as themselves, and having formed a very considerable one myself, especially appropriated to my object, a great portion of my labor consisted merely in the employment of so many rich materials."

They also resemble each other in the possession on the part of each of the organic or nutritive and the reproductive functions, viz.: Digestion, Absorption, Respiration, Circulation, Nutrition, Secretion, Calorification, and Generation. In addition to these, animals possess *Sensation* and *Voluntary Motion*, functions which are not enjoyed by the Vegetable. The latter, fixed to the soil, is enabled to derive from it and the surrounding atmosphere materials inservient to its nutrition; and although some of the lower forms of animals are fixed to one spot during their entire life, and give little evidence of the possession of sensation or voluntary motion, and lead an almost vegetative existence, the vast majority possessing the means of locomotion, and a central organ or stomach for the reception and digestion of food, are compelled to pass from one place to another in search of it. The well-defined differences, readily recognizable by the most ordinary observer in the higher forms of vegetables or animals, renders it very easy to distinguish one from the other, but the lowest types of each require the exercise of great care on the part of naturalists to decide which they belong to. As an illustration of this, the sponge at one time was regarded as a vegetable, while it is now fully recognized as belonging to the Animal Kingdom. The simplest means of demonstrating whether a certain structure has a vegetable or animal origin is to burn it; under such circumstances, the latter invariably gives off a peculiar and unmistakable odor sufficient to decide the point beyond a question of doubt.

ARCHETYPES.

The primary divisions of the ANIMAL KINGDOM have been denominated SUB-KINGDOMS, DEPARTMENTS, etc.; but I prefer to employ, in place of any of these, ARCHETYPES, on account of the fact that the hundreds of thousands of species have been arranged, as the VERTEBRATA, ARTICULATA, MOLLUSCA, or RADIATA, according to *four general plans of construction* observable in them. The last-named, however, is regarded by many naturalists as being defective, and another sub-kingdom, the PROTOZOA, is now generally agreed upon, and the propriety of recognizing two or more in addition to this is strongly urged by eminent observers.

The VERTEBRATA (Lat. *vertere*, to turn) are so named on account of the presence of the vertebral column, which at its upper extremity is expanded into the skull, and terminating in animals in a tail, consists of a series of bones, so arranged as to give flexibility of motion, serve as a central axis for the rest of the skeleton (which is internal), and afford, as already stated, lodgment and protection for the spinal cord, while the brain is safely lodged in the skull. Connected with the sides of the vertebræ are a series of ribs, which are generally united in front with the *sternum*, or breast-bone, thus forming a cavity which affords protection to the organs of respiration and circulation; in addition to the ribs,

two or four extremities are usually appended for purposes of locomotion. The bones are united by ligaments, and moved by muscles, which pass from one bone to another. All of these animals have red blood, with a muscular heart to propel it; some of them, however, are *warm blooded*, while others are *cold blooded*, in other words, the first maintain a uniform temperature, 98° F., while the other rises and falls with that of the surrounding medium. They are also endowed with the five special senses, smell, sight, hearing, taste, and touch, and furnished with two jaws, one above or in front of the other, which are frequently supplied with *teeth* for the purpose of masticating the food, or to be used as organs of offense or defense. In many the teeth are entirely absent, as in birds, etc.

The ARTICULATA (Lat. *articulus*, a joint) are formed of a number of pieces or segments united or articulated together. The skeleton, when present, is invariably external, and incloses not only the nervous system but the muscles which move the body. The various portions are articulated together so as to admit of great freedom of motion to the body and extremities, the latter of which, when present, are quite numerous, never being less than six, and sometimes reaching one hundred in number, as in the centipede. In the worms and leeches, the body is merely surrounded by a soft envelope, in which the segments cannot always be readily observed. The blood, which is white, circulates, except in the higher forms, without a central organ or heart. The organs of vision, taste, hearing, and touch have been observed in them. The jaws, usually more than two in number, open laterally.

The MOLLUSCA (Lat. *mollis*, soft) are distinguished by negative rather than positive characters; they have neither an articulated skeleton nor vertebral column, and the organs of motion and sensation are of a low order, and some of them are fixed to one spot, except during the earliest periods of existence. The body is enveloped in a loose mantle, which in some is capable of secreting one or two shells, which afford protection, and serve the purpose of an external skeleton. The blood is white or bluish white, and propelled by a heart of simple structure.

The RADIATA (Lat. *radius*, a ray) unquestionably hold the lowest rank of the four definite types of structure under which all the higher forms of animal organization may be classified. The predominance of the vegetative or nutritive apparatus over those of animal life is quite conspicuous. The radial symmetry which it presents makes it approximate in general resemblance to plants, and on account of this some of them have been denominated ZOOPHYTES (Gr. *zoon*, animal, *phyton*, plant); these are fixed to the ground and have the form of plants. In some of the Radiata, as in the sea-urchin and star-fish, the skeleton is external, while in the polypi it is sometimes internal. Most of them have a mouth and stomach for the reception of food, while others absorb it through their exterior, like plants; the radiated character, while readily

observable in some, is absent in others, and it is this which has given so much dissatisfaction and has induced the establishment and recognition of a fifth Sub-Kingdom.

The PROTOZOA (Gr. *protos*, first, *zoon*, animal) are in general exceedingly minute microscopical objects found specially abundant in water; a large proportion of them consist of single cells or aggregation of cells, but their animal character is made manifest by their movements and mode of nutrition. PROF. AGASSIZ contends that these minute beings do not constitute a natural group; and he believes that they are only imperfectly understood, and that eventually many of them will be distributed among vegetables, and others to one of the four primary divisions of animals.

CLASSES.

The ARCHETYPE VERTEBRATA are divisible into four CLASSES, based upon the *performance of some special action or function peculiar to each class.* All of these agree in possessing a vertebral column, but differ in other peculiarities of structure, as follows:

The PISCES (Fishes), the lowest class of the Vertebrata, are only formed to live in water; they are OVIPAROUS (Lat. *ovum*, an egg, *pario*, I bring forth); in other words, all but a few species lay eggs. The vertebræ generally present a concave surface to each other, and the space thus formed is occupied by a sac of fluid, that gives very great latitude of motion to the spine, which is sometimes cartilaginous. The tail is generally expanded into a broad fin, and is the principal instrument of progression. In addition to this, there are two pectoral and two ventral fins, which aid in locomotion. Being strictly aquatic in their habits, they respire through the medium of the element in which they live by means of gills. They are cold blooded, and the heart is composed of two cavities, an auricle and a ventricle, which receive the venous blood from the system, and propel it over the respiratory surface whence it is collected into an arterial trunk, the aorta, by which it is distributed over the body, without the intervention of a systemic heart. The body is usually covered with scales.

The REPTILIA (Lat. *repto*, I creep) include a large class of animals, many of which differ so much in form that those who are unacquainted with the subject would hardly suppose that serpents, lizards, and tortoises are all arranged under the same head. The vertebræ of the serpents articulate like a ball-and-socket joint, by which these animals are enabled to coil themselves up in the form of a ring. This class is for the most part adapted to the surface of the earth, and those which live in the water are obliged, with few exceptions, to come to the surface to breathe, as they are provided with lungs in place of gills. The general habits of all of them are lazy, and in cold and temperate climates they pass almost the entire winter in a state of lethargy. With the exception of a few species which bring forth their young alive, they are all ovipar-

ous and cold blooded. The heart usually consists of three cavities: one, the systemic auricle, receiving the blood from the body, and another, the pulmonic auricle, from the lungs; both of these cavities communicate with a ventricle, whence the blood is propelled through the body as well as to the lungs. Certain animals, which were formerly arranged in this division have been placed in a separate class; they are

The AMPHIBIA (Gr. *amphi*, both, *bios*, life), so named on account of the faculty which these animals possess of living in the water or on the land; it includes the frogs, toads, salamanders, etc. During their earlier and immature existence, as tadpoles, they partake of the character of fishes, but eventually undergo a peculiar metamorphosis, during which the extremities are developed, and they then approximate to Reptiles in their general structure and mode of respiration, and, like them, are oviparous, cold blooded, and merely covered with a thin skin.

The AVES (birds) are formed for rapid motion in the air, and the bones of the skeleton are quite light and hollow, which greatly lessen the specific gravity of the body. The anterior extremities are invariably constructed so as to aid in flight, while the actions of standing, walking, scratching, and swimming demand different modifications of the posterior extremities. Their jaws are furnished with a horny bill, varying in form according to the nature of the food. The divisions of this class have been chiefly founded by ornothologists on modifications of the bill and feet. They are oviparous, and the ovum, inclosed in a calcareous shell, is perfected by incubation after extrusion from the body. Possessing a double circulation, systemic and pulmonic, with a heart having two auricles and two ventricles, along with the most perfect respiratory apparatus; circulation and respiration are rapid, and they are consequently warm blooded, their temperature frequently rising as high as 107° F. The feathers which cover them, acting as a non-conducting medium, serve to retain their heat.

The MAMMALIA (Lat. *mamma*, a breast), so named from possessing mammary glands to suckle their young, are the most highly organized class of animals. Taken as a whole, they are not characterized so much by the possession of any particular faculty as by the perfect combination of the different powers, which render the animals belonging to it capable of a much greater variety of actions than any others can perform. They are distinguished in particular by the high evolution of that portion of the brain named the cerebrum, which is regarded as the seat of intelligence and the reasoning faculties, whereby means are adapted to ends for the purposes of the individual. These attributes reach their highest development in man. It is the recognition of these facts which has induced the naturalist to place this class at the head of the Animal Kingdom. Like Birds, they have warm blood, a heart, with four cavities, two auricles, and two ventricles, and a perfect pulmonic and systemic circulation.

Provision is made for the regular renewal of the air in the lungs, not only by the movements of the ribs but by the action of the diaphragm. The temperature of this class is about 98°. To confine the heat and prevent its rapid absorption by the surrounding atmosphere in cold climates, many of these animals are liberally supplied with hair or fur. The immense quantities of blubber or fat under the thick skin of the whales serve the same purpose.

SUB-CLASSES.

The CLASS MAMMALIA are divisible into two SUB-CLASSES; the first of which, the VIVIPARA (Lat. *vivus*, alive, *pario*, I bring forth), embracing ten ORDERS, bring forth their young alive; the second, the OVOVIVIPARA (Lat. *ovum*, egg, *vivus*, alive, *pario*, I bring forth), produce living young in a more immature state than the former, the egg being developed within the body of the parent, without any connection with the womb, by means of a placenta; of these there are only two ORDERS.*

ORDERS.

The MAMMALIA are thus divisible into twelve ORDERS, *founded upon certain well-marked peculiarities of structure*, and in arranging them advantage is taken of external and easily recognized differences: the variations of structure in the extremities, and the arrangement, form, and structure of the *teeth in particular*, serving as valuable guides or aids in this respect. It would be interesting and profitable to dwell at length on these points and their characteristic manifestations, while reviewing the different ORDERS, but this would consume too much time now, and not be in accordance with the plan of the lecture. It will suffice to say, in general terms, that the sub-class PLACENTALIA includes animals whose extremities present two specific points of difference, and it is therefore divided into, first, the UNGUICULATA (Lat. *unguis*, the nail or claw), including eight ORDERS which have their extremities armed with nails or claws, but free for the exercise of touch upon their under surface. Six of these orders are Carnivorous, while two of them are Herbivorous. 2d. The UNGULATA (Lat. *ungula*, a hoof) embrace two ORDERS, having hoofed extremities and feeding upon vegetables. The two ORDERS of the IMPLACENTALIA have extremities which entitle them to be classed with the UNGUICULATA; they vary, so far as their food is concerned, a few being Carnivorous, the majority Herbivorous. The teeth of these different ORDERS generally correspond with the extremities and with the character

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* PROF. OWEN arranges the above SUB-CLASSES as follows: the first as the PLACENTALIA (Lat. *placenta*, a cake), in which a soft vascular body is found adherent to the uterus and connected with the fœtus by the umbilical cord; the second as the IMPLACENTALIA, or those without a placenta. The distinction thus established is much more satisfactory than the first, from the fact that the young of each SUB-CLASS are brought forth alive.

of the food, being sharp and pointed in those possessing claws and feeding on flesh, while they present broad grinding surfaces in the animals having hoofed extremities and feeding on vegetables. The UNGUICULATA are:

The BIMANA (Lat. *bis*, twice, *manus*, hand), including the single GENUS, HOMO, or man, present as physical characteristic in contradistinction to other animals, the maintenance of the erect position; and the possession of two hands with an *opposable thumb*, that enables man to accomplish a variety of things by its aid which no other creature can effect. He is furthermore distinguished for the possession of articulate language or speech, and the power of not only communicating his thoughts to his fellow-man in his own day and generation, but with the aid of the hand in writing, to transmit them to posterity. Not only the character of his teeth, but other circumstances prove that he is *Omnivorous* (Lat. *omnis*, all, *voro*, I devour), or in other words, he is intended to live on a mixed diet, vegetable and animal.

The QUADRUMANA (Lat. *quatuor*, four, *manus*, hand) embrace monkeys, apes, etc., all of which possess four hands, somewhat, but not exactly, analogous to the hand of man; they might be compared indeed with as much propriety to his foot as to his hand, as they are all used for locomotion. Although able to stand nearly erect, their natural position when moving about is mainly on all-fours.

The CHEIROPTERA (Gr. *cheir*, hand, *pteron*, wing) are animals having the anterior extremities, and especially the hands, so modified as to serve the office of wings. This ORDER includes the bats, which were formerly regarded by naturalists as birds, but the possession of teeth, and suckling their young like other Mammalia, clearly demonstrate the CLASS to which they belong.

The INSECTIVORA (Lat. *insectus*, an insect, *voro*, I devour), such animals as the hedge-hog, mole, and shrew, feed exclusively upon insects.

The CARNIVORA (Lat. *carnis*, flesh, *voro*, I devour) have teeth which are peculiarly adapted for seizing upon and destroying living prey and tearing their flesh. The lion, tiger, bear, dog, seal, etc. all belong to this order.

The CETACEA (Lat. *cetus*, a whale) were formerly regarded as fishes, but the possession of warm blood, bringing forth their young alive, and suckling them, prove that they belong to the Mammalia. Those which are provided with teeth seize upon large marine animals, while others that have none, derive their support from the smaller kinds by engulfing them with a large quantity of water in their capacious mouths. There are others again that are strictly Herbivorous, which some naturalists arrange as a distinct ORDER, the SIRENIA.

The RODENTIA (Lat. *rodo*, I gnaw), comprising rats, mice, beavers, squirrels, rabbits, guinea-pigs, etc., are characterized by having two large incisors in each jaw separated from the molars by a wide space;

these teeth have enamel on their front surfaces only, so that their posterior border being worn away more than their anterior, they are always kept set like a chisel.

The EDENTATA (Lat. *e*, privative or deprived of, *dens*, a tooth), including the sloth, armadillo, ant-eater, etc., have no incisors or front teeth.

The two ORDERS arranged as UNGULATA are,

The PACHYDERMATA (Gr. *pachus*, thick, *derma*, skin), distinguished for the thickness of their skin, and include the horse, hog, tapir, rhinoceros, and elephant, the last of which, from the fact of possessing claws, is an unguiculated animal.

The RUMINANTIA (Lat. *rumino*, to chew the cud) comprise those animals which possess a compound stomach, and who, after their food has been taken into the mouth and swallowed, regurgitate it by the stomach throwing it back into the mouth to be rechewed as a *cud*, when it is again swallowed, and, by a peculiar elongation of the œsophagus, the bolus, in place of entering the first cavity as it did in the previous instance, passes on to the third. The ox, sheep, deer, etc. are contained in this ORDER. The first two of these are named *hollow horned*, on account of their having hollow horns projecting in front of the skull that are never shed. The deer, on the contrary, are called *solid horned*, from the fact that the antlers are solid like bone. These are cast or shed and renewed each year. All of these animals, with the exception of the camel, have no front teeth in the upper jaw. The camel is also unguiculated.

The SUB-CLASS IMPLACENTALIA embrace the last two ORDERS of the MAMMALIA, as follows:

The MARSUPIATA (Lat. *marsupium*, a pouch) are so named on account of the presence of a pouch in the front and lower part of the abdomen of the females, which serves as a temporary abode for the young after birth. The kangaroo and opossum belong to this ORDER.

The MONOTREMATA (Gr. *monos*, one, and *trema*, perforation) have a common outlet for the generative and excremental products, and in this respect they resemble birds.

The different ORDERS thus briefly referred to are each divisible into

FAMILIES.

Much confusion is induced by the careless manner in which many naturalists employ the term FAMILY, frequently using it as synonymous with ORDER. Such, however, is not the case; for each FAMILY is made up of GENERA that resemble each other in certain particulars, and are separated from other GENERA which belong to the same ORDER, *on account of some modification of form or structure.* Thus the dog, which belongs to the FAMILY CANIDÆ (Lat. *canis*, a dog), is distinguished from the bear, belonging to the FAMILY URSIDÆ, not only by the *form of the body*, but also by walking upon the *ends of the toes* in place of the *sole*

of the foot; this being due to a *structural difference* in the shape and articulation of the bones in the lower part of the limbs. Both of these FAMILIES belong to the ORDER CARNIVORA.

GENERA.

As already stated, the ORDER BIMANA includes only a single GENUS, HOMO, or man. Divisible, however, as most ORDERS are into Families embracing several GENERA, *minor details of structure* frequently serve as generic characteristics; thus, *advantage is sometimes taken of such slight anatomical peculiarities as "the number, disposition, or proportions of the teeth, claws, etc."* in the carnivora, to distinguish one *genus* from another.

SPECIES.

As the anatomical differences which separate GENERA of the same FAMILY are so slight, it would be reasonable to infer that the division of a GENUS in SPECIES must be based upon peculiarities still less marked, and such is the case. Thus, "*color, size, proportion*, etc." serve as means for the recognition of different SPECIES of the same GENUS. "The principal characteristic of species is the power of producing beings like themselves who are also productive. A species may be modified by external influences, and thus give rise to races or varieties, but it never abandons its own proper character to assume another."

To recapitulate briefly: the ANIMAL KINGDOM, embracing all animals, recent or extinct, is divisible into ARCHETYPES, *according to four general plans of construction observable in them;* these again into CLASSES, *based upon the performance of some special action or function peculiar to each class;* these into ORDERS, *founded upon certain well-marked peculiarities of structure;* these into FAMILIES, *on account of some modification of form or structure;* these into GENERA, to distinguish which, advantage is sometimes taken of such *slight anatomical peculiarities as the number, disposition, or proportion of the teeth, claws, etc.;* and lastly, the latter into SPECIES, in which *color, proportion, and size* serve as characteristic differences. This is the key to the CUVIERIAN CLASSIFICATION OF ANIMATED NATURE, and which unfortunately many persons who have devoted years to the study of natural history apparently have the most confused and erroneous ideas in relation to. *Comparison* throughout is the basis upon which the entire system rests, and it has its foundation in *nature* rather than art.

In conclusion, like a traveler who, on the top of a mountain, taking in an extended view of a new and beautiful landscape beneath, observes here and there prominent objects of interest, on descending to the plain finds an immense number of minor objects claiming his attention, is better prepared to understand the exact relation one part bears to another, so it is trusted that this address may answer a similar purpose to some of you in

the study of Natural History. In the facts that have been thus imperfectly presented, my aim has been to give them in a plain, simple, and comprehensive manner; but embracing, as the remarks have, only a general and hasty survey of leading points, they should be regarded by those who may desire to become better acquainted with the subject-matter as merely introductory to a regular course of study in this direction.

ALVEOLAR ABSCESS.

BY W. H. ATKINSON, M.D.

Read before the Brooklyn Dental Association.

To fully comprehend the prevention and treatment or cure of any departure from the state of health, involves an intimacy of knowledge of the formation, development, and nutrition of the body, not yet possessed by any one individual.

It thus being manifestly impossible to do the whole work, and pronounce in one sentence the definition and limitation of what constitutes not only the body but the actions it is destined to perform, which include normal and abnormal manifestations, it may be well to do what we can in unfolding the intricacies of the task before us.

And that we may address ourselves to the proximate understanding of "*alveolar* abscess," it is important that we comprehend the condition so denominated. If it were once settled just what constitutes the "alveolus," the work would be simplified and made easy. But looseness of definition leads to vagueness of understanding, both of which mystify diagnosis.

Alveolus properly signifies the bony socket, lined with dense fibrous tissue, in which the root of a tooth has its proper location. It is plain, then, that "alveolar abscess" is an "abscess" in this place.

Many further conditions are involved in this investigation, viz., the alveolus must be in a living state, supplied with soft structures in which the blood-vessels and nerves ramify and bring about the condition we are considering, because of some modification in their functional activity.

Now this modification is the cause which is so difficult of solution.

This degenerated nutrition has been treated of as the result of a process denominated "inflammation;" which itself is as hard to define as the process it purports to pronounce.

Were we to rigidly confine ourselves to the etymology of the term, we should regard this process in the light of a consuming by oxidation, "burning," the understanding of the nature of which introduces us into the hidden fields of electric, magnetic, and chemical (which together constitute *molecular*) *actions*.

These actions differ in the diverse tissues composing the body according to the degree of approximation toward the extremes of fluidity and

solidity, the compromise between which renders it possible for inherent affinities to produce the circumscribed currental movements by which nutrition is effected.

In alveolar abscess, we have the whole range of structure involved from unpronounced amorphous mucous mass, or chaotic material in the "juices of the flesh," from which arise and by which are nourished the neural and muscular fibrillæ, the vascular and osseous, no less than glandular and dermal tissues.

If, then, all these must be involved in destruction just in the ratio of the size of the sac in every case of matured alveolar abscess, is it not of some moment to us to be able to detect the order of its inception and progress from its first beginning to its most unmistakable presence? Where then is the point of departure from normal activity? Is it in the "juices of the flesh?" or is it in the granular living contents of cells? Or may it not have its inception in a refusal on the part of the "formed material" of the cell-wall to afford free transit into and out of the parenchyma of the cell to the pabulum or juice upon which it subsists? Although it may be clear to him who has investigated this subject, that all departures from healthy action take their origin in the neural sea or juices of the flesh; yet it is difficult to prove this to the uninitiated mind, short of laborious and tedious detail of nutrient activities. The oneness of this sea throughout the whole range of the body within the outer pellicle or skin, whether that body be large or small, composed of one organ or many, deriving their sustenance from this elemental mass, renders the whole body, or any part of it, subject to change in accordance with the extent of the application and the force of the disturbing agent.

Let us take a case of common phlegmonous abscess, and trace it from its origin to its culmination. The inception depends upon the poisoning of pabulum or mucous mass by the accumulation of innutritious or effete matter, which disturbs the nutrient action of one or more cells by depriving them of their contact with pure pabulum, or healthy liquid food. These salts and gases being held in solution, have a tendency to diffuse themselves in every direction throughout the free juices of the flesh, and this predominance of chemical affinities disturbs the equipoise of the currental movements denominated vital, and is destructive in the exact proportion of its predominance. A wave of resistance to the onward progress of this outward motion from the poison centre, is set up in the healthy neural sea, and is the line of stasis or disturbance of the regular ebb and flow of this tide, and limits the size of the sac of the abscess. At this stage of progress, solution takes place at one or more points, and progresses, thinning the wall nearest the surface of the body by successive encroachments of solution, and breaking down into pus, the abscess ultimately bursts and discharges its contents, repairing the mischief by process of granulation.

Now to cure an abscess at any stage of its development, it becomes necessary to arrest its further extension, and at the same time expedite the removal of the already killed tissues. There are two ways in which this may be done.

To effect resolution in the periphery of an abscess, *stasis* of the fluids must be secured as already asserted. In good constitutions this spontaneously occurs so soon as the balance of currental forces between the poisoned point and the tide of mucous mass has been reached, turning each wave back upon itself, thus setting up the line of demarkation between physiological and pathological actions. I said there were two methods of effecting cure of abscess. So there are, whether the cure consists in resolution or evacuation; both of which must occur in some part of every abscess that finds pronouncement in the living body. They consist in mechanical and medicinal means.

Pressure will limit the outward wave whenever applied upon a purely healthy portion of structure, and define the size of abscess by turning back the wave of nutrient activity in the deteriorated part upon itself, preserving the outer sea from the threatened disturbance.

Medicines which control the neural currents in mucous mass and afferent and efferent nerves, also act in the same way that mechanical pressure does in arresting the poisoned nutrient wave, and in like manner either abort or reduce the size of the abscess.

Aconite, nicotine, and soporifics in general, are notable examples of remedies which act in this manner.

Vigorous exercise also acts in curing incipient abscesses by amputating neural waves arising in the mucoid sea, thus affording sufficient freedom for the distribution of the aberrant (pathological) current to the degree of dispersion of the poison beyond the point of destructive power.

Cure by passes and laying on of hands, patting and other movement cures, act in this way. All these invite the nerve-force away from the weak point; in forced marches it is unconsciously done, while the mind is directed intently to safety in flight, or to the accomplishment of an object of paramount importance in attack, but purposely and consciously when medicinally induced. Just how these remedies produce their beneficent results is not so clear, unless we are aware of the great importance that attaches to mental influences; for these coincide with or cure disease, in its incipiency, to an extent scarce credited by those who have not made it a branch of special study.

When the mind coincides with the aberrant action, the disease is aggravated in intensity and extent of derangement of the part. But when the mind is opposed to, or entirely abstracted from the point of the disease, it is cured altogether, or is at least mitigated in character and size or extent of parts involved. This is effected by two specific modes of curative agency, viz., starving and antidoting. Pressure and reversed cur-

rental waves in mucous mass are the special examples of starving and antidoting, so frequently presented in practice, in what are called spontaneous cure of abscess by resolution and by absorption.

Nature's prime object being to get rid of a poison, she sets about her purpose by profluviæ, with the intent of diluting and washing it away. And being baffled in this, she incloses the poisoned point by infiltration of coagulable lymph in the surrounding cellular tissue, thus limiting the diffusion of the poison throughout indefinite extent in the mucoid sea!

After this has been accomplished, there is abatement of fever and all constitutional derangement, and she is left to the slow cure of resolution and absorption, or solution of the most outward part of the abscess-wall, until rupture and discharge of its contents afford opportunity to replace lost structure by granulation and final closure of the continuity of tissue. But many abscesses do not thus benignly betake themselves to flight, but persist in pouring out a deteriorated instead of a healthy plasm. And thus "issues" of long duration continue to annoy the patient with their unwelcome presence. Especially is this the case with alveolar abscesses that have spontaneously discharged themselves and become painless to their possessors.

It is no uncommon occurrence to meet with medical men and intelligent patients who deprecate the arrestation of this flow, lest the "virus" (which they fancied had its outlet here) should so accumulate in the circulation as to throw them into a fever, or lay the foundation of a morbid growth! I have seen cases where periodic attempts at cure and exacerbation of the abscess had alternately held dominion of the nutrition of the part from one to twenty years, which had been regarded as a sort of safety valve to the health of those in whom it occurred! As before stated, these have included intelligent laymen, no less than learned (?) doctors!

I hold it to be good doctrine in medicine and surgery, no less than in morals, to "right a wrong action at the first feasible moment!"

And now how shall we proceed to accomplish the work before us? Let us take our cue from Madame Nature herself, and attack the enemy in the very citadel of its habitat, the pabulum of the body, the mucoid sea, by stopping off the supplies from the alimentary canal and the general circulation, both vascular and neural; at the same time further reducing nutrient supply to special locations by active employment of both body and mind, thus exciting all the excretory and depurative functions of the body to eliminate any and every morbific tendency or poison that may lurk in the hidden recesses of the complicated structures which compose the organs of the whole body. Thus we will have cured or forced the mischief into special manifestation of its presence.

When once located, *art* has an advantage over *nature*, by whose conjoint power a more rapid and complete restoration is possible than when the latter is left alone to expel the mischievous cause of trouble.

Art has hitherto advocated the use of "poultices" as highly beneficial treatment in cases of abscess. How do poultices act? They have a threefold action, viz., pressure, moisture, and accumulation of heat, which in the main hasten the suppurative process. Hence are contraindicated about the face and alveolar borders, where it is so important to prevent the loss of substance that must be replaced by scar tissue, or present unsightly disfigurement of form, and immobility of parts.

I have frequently seen cases of extensive necrosis of the bones of the face, that I attributed to the pernicious influence of poultices! Also have had the great satisfaction of arresting inflammations in a few instances, that would undoubtedly have had similar results had the poultices and relaxing modes of treatment been persisted in. The warm applications were discarded, deep incisions made through the periosteum into the substance of the bone where still attached, and where separated from the bone, a series of short incisions were made around the edges of the sac, being sure to disgorge the congested and healthy periosteum, thus preventing further detachment. Dressed with vin. opii and gentle pressure, supporting the system by tonics, beef tea, etc.

Just as soon as one single cell is actually dead, it should be cut down upon and removed, and we should be certain of complete cure. Were it not for the difficulty—may I not say impossibility?—of diagnosing abscess at so early a stage, the knife in proper hands would be the only means of cure. It is the best means even after the diagnosis is made. But in incipient abscesses, where the sacs contain only an albuminoid glairy substance, all that is requisite for the cure is to open freely and completely evacuate the cavity, when it will need no further attention if the patient be in good general health. But if the contents be a little turbid with flocculi of lymph, depriving them of that albuminous transparency indicative of healthy plasm, it will be well to dress with wine of opium, with a syringe forcing it into all the inequalities of the cavity; or upon a pledget of cotton, nicely wiping it against the wall of the sac in every part, removing it at once, and leaving it without any dressing, further than a bit of cotton saturated with tannin and glycerin, made into a bat or pack to lay over the external opening to prevent the ingress of foreign bodies and inducing agglutination of the lips of the orifice. Simple as this treatment is, it succeeds in the great majority of cases. Dr. Foote asked, "What is the *local* cause of abscess?" To which Dr. A. replied, Death of one or more cells, involving a territory of greater or less extent.

After which, the conditions already stated in the paper just read, make their appearance in serial order of pronouncement. There can be no abscess proper, without both *constitutional* degeneracy and *local* lesion.

Where merely local lesion is present in perfectly healthy juices and organs, no abscess nor ulcer will follow such simple mechanical separation

of parts; but union, by what is called "first intention," will take place, by simply securing coaptation of the severed parts.

Where persistent discharge of pus, sanies, or ichor, separately or in combination, supervene upon the rupture of a ripened abscess, it becomes necessary to change the morbid exudate into benign plasm, to secure healing of the abscess by healthy granulation. In case of any of the above discharges, I prefer iodine in creosote as an escharotic application, because it has the power to kill the cells too weak to be restored to health, and to harden and hasten the metamorphosis of the next stratum of cells into the proper tissues of the part, thus conserving form, feature, and function.

THE TUMORS OF THE MOUTH.

BY JAS. E. GARRETSON, M.D.

(Continued from page 628, vol. vii.)

Osteo-Sarcoma admits of operation to a late period; its extirpation may be fearlessly attempted with a good hope of success even after the tumor has an enormous bulk, and experience has shown that the operation, though it may be bloody and severe, yet seldom terminates but in a fortunate issue. A case figured in his Surgery, p. 426, in which the operation resulted in a permanent cure, would seem to warrant procedure against any of these growths.

Osteo-carcinomatous tumors are, on the contrary—I would speak my own experience—if I were to say, not at all amenable to treatment of any kind. Miller thought they might be operated on at an early period successfully, but I must say (and clinically I have seen a great deal of this disease) I never saw one cured. This assertion implies, however, that the diagnosis has been correct; there are so-called medullary cancers cured every day by the most brazen quacks. Cancerous deposits seem so evidently the work of systemic conditions that when you remove a part containing the localized disease, you seem but to have exposed the conduits which are engaged in bringing to the bulk fresh material; you cannot get beyond the disease with your knife, all adjoining parts are more or less infiltrated with the materiæ morbis.

"I entirely differ," says Mr. Hancock, "from Mr. Stanly and Mr. Liston, that medullary carcinoma commences in the antrum of Highmore and extends backward to the pterygoid process; but, on the contrary, from what I have observed, I firmly believe that the disease commences in the cancellated structure of the body of the sphenoid bone and bones at the base of the cranium, and that, however early we may perform the operation, we never succeed in eradicating the mischief, which is sure to return at a longer or shorter period according to circumstances."

It strikes me that if Mr. Hancock had only for one moment considered the constitutional relations of cancer, he need not have found himself in dispute with his illustrious peers. For my own part, I know that medullary disease does begin in the maxillary sinus, for I have over and over again seen such cases, and so also may it begin, as location is concerned, almost anywhere else about the body; the tumor is not the disease, but only the local expression of it.

But however this may be, I quoted Mr. Hancock's expression only as it is indicative of a general experience of the difficulty of getting away by operation even all of what is apparently the local disease; and how could it be otherwise, seeing the tumor is not encysted, being rather an infiltration as it were?

What then is to be done in this disease? I can only answer, let every man use his best judgment. We know the history of the disease, that it tends to fungoid conditions, that it becomes so offensive as to make the patient not only disagreeable to his friends but also to himself, that it is associated with the most unbearable pain, etc. We may feel ourselves justified in operating for a twofold reason: first, that we may give to the patient temporary relief; second, with the hope that the reappearance of the disease may be in some internal situation, rather than the site of removal; thus at least putting out of sight a disgusting mass which it can be of little use to have under manipulative control.

There are, however, the following general indications which should always be taken into consideration, and which, being met, may possibly result in good to the patient:

1st. As the disease is due to or accompanied by perverted nutrition, every effort should be made to remove any derangement in the nutritive organs, while the general health should be cared for through the generous use of rich diet, tonics, and alteratives.

2d. To remove or check local irritation.

3d. To continue the constitutional treatment through all stages of the disease, not neglecting the quieting assistance of the opiates.

4th. To operate early, if at all, provided the disease presents such conditions as to warrant interference.

5th. To select such means for its removal as will be likely to produce the least irritation.

Prof. Smith thinks the greatest amount of good is to be gotten from the chalybeates. He recommends Vallet's mass in doses of from five to ten grains three times a day. In one case, he says, in which he was consulted with a view to operating and declined on account of the rapid progress of the disease, he suggested the use of Vallet's mass conjoined with the application of the powdered carbonate to the sore, and the patient lived for eight years without the disease having made any very great progress. Justamond, of London, says Dr. Smith, gave from sixty to one

hundred and twenty grains of the ammonio-chloride per diem; while Carmichael, of Dublin, expresses himself as having derived much benefit from washing ulcerated scirrhus with a solution of sulphate of iron.

Sulphate of zinc is an admirable local application. A remarkable case, exhibiting its value, is presented in the person of an old woman who has been a habitué of the University of Pennsylvania for the past several years; the local use of this preparation, combined with high tonic constitutional treatment, keeps the disease completely in check. I remember myself the old woman for some four or five years; she does not get well, but she certainly does not seem to grow worse.

Chloride of zinc and solutions of the salt are favorite preparations. I believe, from what I have seen, that if it were possible to cure a cancer by local means, chloride of zinc would prove the most formidable antagonist we could bring to bear against it. Its power to arrest phagedenic action is wonderful; for chancres, for example, I should scarcely think of using anything else. The medicine has more than a cauterant property, it is peculiarly alterative. If the tip of a pine stick is dipped into the deliquesced salt and in this state applied to a chancre, you will get for yourself a perfectly non-specific granulating ulcer in the course of a week. I have often converted these specific into healthy sores in three days' time. Chloride of zinc judiciously applied to any indolent, irritable, or bad ulcer, will be found to tend markedly to a change for the better.

Concerning the use of this agent in cancer, we have many commendations, particularly from European surgeons; but, as can be very readily apprehended, nowhere in the range of its application is more judgment required for its proper employment than here, for it is a cauterant, a stimulant, an antiseptic, and alterative. Dr. Zuerine, of Vienna, relates a case of cancerous ulceration of the septum nasi which threatened to destroy the whole nose; one grain and a half of the chloride of zinc, he says, were dissolved in one ounce of distilled water, and the scabs being removed, the sore was penciled over several times a day with the solution; at the end of a fortnight a healthy granulating surface was found underneath the thick crust which covered the sore, and this being occasionally removed, and the solution reapplied, it cicatrized in five weeks.

Mr. Tuson has published some new cases to show the value of certain preparations of chlorine in cancerous affections. In one case which he publishes there was an extensive cancerous affection of the right breast and neck which was treated unsuccessfully for a long time, till a paste was applied, made of one part of chloride of zinc to three of flour; this was well mixed, and moistened with water, and then applied over the ulcerated parts. The zinc was also given internally; half a grain was ordered in a wineglassful of caraway water every morning. The chloride of zinc paste was applied again, and when the slough separated, the ulcerated surface healed kindly. The cancerous deposition continued for some time,

and the dose of the metal was increased to three-quarters of a grain and continued for three months. The improvement, although very striking, was not permanent, as the patient suffered a relapse which ended fatally. The case, however, was sufficient to show that the treatment had made considerable impression on the disease, and especially in healing the open cancer, which Mr. Tuson had found to be the result in several other cases.

A plan which I have frequently employed in removing growths, and with a very fair success, has been the amputation of the tumor, skin and all, and then laying in the wound cotton saturated with the chloride of zinc in solution. In the case of a young lady having a tumor over the trachea, and which had returned after three removals, I adopted this course with complete success.

The great suffering associated with carcinoma makes necessary the free use of opiates, both locally and internally. Stramonium, belladonna, aconite, opium and its preparations, hamamelis, are highly recommended. As much as twenty grains of sulphate of morphia have been administered during the course of a single twenty-four hours.

(To be continued.)

OBSERVATIONS ON ARTIFICIAL PALATES.

BY NORMAN W. KINGSLEY,

Professor of Dental Art and Mechanism in the New York College of Dentistry.

As the interest in the treatment of cleft palate has become more universal within the last few years than formerly, I propose to give briefly the result of my observations in the application of artificial vela.

It is now over six years since I made my first successful instrument—and by successful, I mean an appliance which could be worn with entire comfort, and enable the wearer to articulate perfectly. Since that time I have supplied artificial palates for nearly forty patients, representing all classes of society, and presenting every variety probably of the congenital deformity.

I have experimented with the best materials it was possible for me to obtain for that purpose, either in this country or in Europe, and if time, labor, patient observation, and abundant experience lead to correct conclusions, I think I may be justified in claiming that I have arrived at such. There is a great similarity in the conformation of this defect in nearly all these cases; so much so that an instrument made upon the same principles substantially is applicable to them all. The division of the soft palate is uniformly along the mesial line, showing a portion of the bifurcated uvula pendent upon either side. This division in many instances does not extend to the posterior edge of the palatine bone, but

when it divides the palatine and maxillary bones to any extent, it rarely follows the mesial line, but rather one or the other of the nares.

But while there is such a similarity in the physical developments, there is a very great dissimilarity in the functional developments of the organs affected. Nearly all adult patients have little or no difficulty in deglutition; but the function of articulation is always not only seriously impaired, but strikingly different in almost every case. Formerly I was inclined to think that where the palatine and maxillary bones and alveolar process were involved in the deformity, there would be a correspondingly defective articulation; but I have seen persons with a simple division of the soft palate of a very limited extent, whose speech could not be understood in ordinary conversation. And again, I have a patient where nearly the whole of the roof of the mouth is gone, and originally was complicated with a double hare-lip, whose articulation of nearly every sound of the English language is perfectly good. The only benefit to be derived in such a case from the wearing of an artificial palate, would be the correction of the articulation of the few defective words, and the changing of the disagreeable tone of the voice.

Probably the first permanently successful effort at a remedy of these defects by artificial appliances, was that made by our countryman, Dr. C. F. Stearns, for himself, about 1842. It was made of substantially the same materials as now used, viz., soft vulcanized rubber, and was most decidedly a success. The form of it was objectionable, as it was not readily duplicated; besides being complicated with gold springs which were liable to become disarranged. But it was worn with comfort and accomplished the desired result. A full account of this apparatus, written by Dr. Stearns himself, has been published in a number of editions of Harris' Dental Surgery.

Some ten years or more ago, Mr. Sercombe, a distinguished dentist of London, attempted to carry out the plan of Dr. Stearns, but finding it so complicated he abandoned it, and in its stead made a very ingenious and very simple application of sheet rubber; first making a plate of any suitable material (he now uses hard rubber) to cover the fissure of the hard palate, and to its posterior edge attaching an apron of sufficient length of soft rubber. This was found to be of great assistance in some cases, but could not be relied upon at all times or in all cases. A full account of these fixtures was published, with illustrations, in the Transactions of the Odontological Society of London.

For a few years past, M. Preterre, a dentist of Paris, has given much attention to this subject, and has had a great many cases under his care. I am not aware that he has ever published any description of his appliances; but in the People's Dental Journal, of Chicago, for July, 1864, Dr. Bogue, referring to his visit to Europe, says:

"I sought out and examined many of these patients; listened to their

speech with the artificial vela in place, and also with them out; examined them, both as to their adaptation and construction; and, although the improvement was most marked, still the appliance bore the stamp of imperfection. I saw and conversed at length, and many times, with the operators in these cases, and more particularly with one to whom many of the French surgeons more often refer their hospital and other patients than to any other, and although he exhibited to me models of probably more than a hundred cases of various sorts, and explained to me his mode of operating, and showed me a multitude of pieces of ingenious mechanism, I was unable to find any apparatus that exactly accomplished the desired object."

Fig. 1

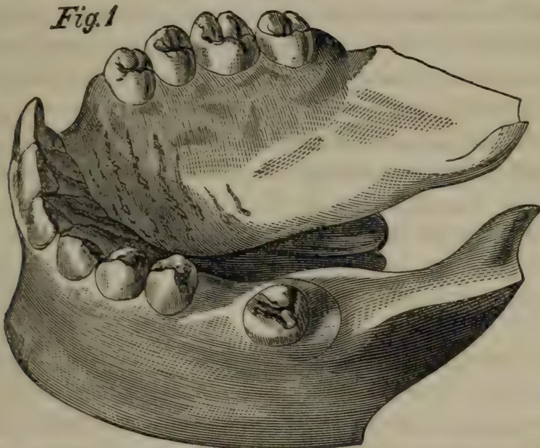


FIG. 1 represents a model of a fissured palate, complicated with hare-lip on the left of the mesial line. There is a division also of the maxilla and the alveolar process; the sides being covered with mucous membrane which come in contact with each other, but are not united. The left lateral incisor and left canine tooth are not developed.

I have seen some of the appliances made by M. Preterre, and in principle they were not unlike Mr. Sercombe's. He uses hard rubber to fill the anterior part of the fissure, and in some cases the apron of soft rubber is attached to it by vulcanization, and in others independently, so that it can be replaced; the whole precisely the same as described by Dr. Cushing, in the May number of the DENTAL COSMOS, as "*Dr. Bogue's improvement.*" Dr. Cushing would hardly have been led into such an error, if he had been thoroughly conversant with what had been previously accomplished.

My first efforts were in the direction of simplifying the plan of Dr. Stearns, as the leading feature of his more nearly met the requirements of such cases than anything else at that time ever made. The prominent feature of his was the division up from the posterior edge, to provide for the contraction of the sides of the fissure. This feature was continued

in mine until the latter part of the year 1864; when I abandoned that principle entirely, and introduced the form which I have used with marked success ever since. It restores, almost to perfection, the lost form to the

Fig. 2

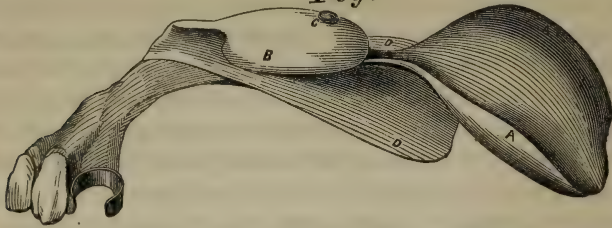


FIG. 2 represents the artificial velum, as viewed from its superior surface, together with its attachment and two artificial teeth to fill the vacancy.

The lettered portion of this appliance is made of elastic vulcanized rubber; its attachment to the teeth of hard vulcanized rubber, to which the velum is connected by a stout gold pin, firmly imbedded at one end in the hard rubber plate. The other end has a head, marked C, which being considerably larger than the pin, and also the corresponding hole in the velum, it is forced through—the elasticity of the velum permitting—and the two are securely connected.

The process (B) laps over the superior surface of the maxilla (the floor of the naris), and effectually prevents all inclination to droop.

The wings (AA) reach across the pharynx, at the base of the chamber of the pharynx, behind the remnant of the natural velum.

The wings (DD) rest upon the opposite or anterior surface of the soft palate.

parts, and meets all the requirements of an artificial velum, to a degree unapproached by any other instrument, except those on the principle of Dr. Stearns.

Fig. 3

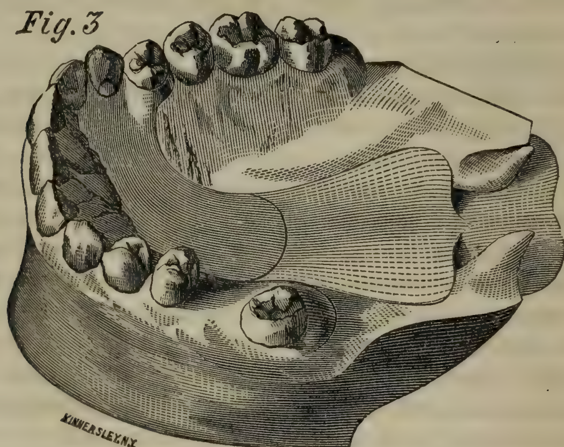


FIG. 3 represents a model the same as Fig. 1, with the appliance, Fig. 2, *in situ*.

The wings (DD) in Fig. 2, and the posterior end of the artificial velum only, in this cut being visible.

In the last edition of Harris' Dental Surgery is published a minute account of the method of producing these vela. Although the form used now differs from that there described, the method of obtaining moulds for

producing them is in all essential particulars the same, to which the reader is referred, as a repetition in this article is unnecessary.

The material used in the construction of this velum is substantially the same as has been used for this purpose for over twenty years—soft vulcanized rubber. It is of a perishable nature when exposed to the secretions of the buccal and nasal cavities, but it is the only material now known to the profession which will to any extent meet the requirements of the case. We are favored from time to time with great "improvements," by which it is claimed that a mere change of form will increase their durability. Let not the profession be misled by any such delusive idea. I have often been deceived by the same appearances. I have experimented with every variety of combination of rubber with sulphur and other substances for this purpose that I could lay my hands on, and the results are substantially the same, no alteration of combination will materially affect it. They will all become useless in a few months. The secretions which come in contact with them have far more to do with their durability than their peculiar form or composition. In some mouths they will be useful for from one year to eighteen months, and the same material, used in the same manner, will become almost useless in other mouths in less than three months. Any change of form which will meet the requirements of the case will not increase the durability to any extent; it is inherently perishable.

The anterior part of the instrument may be made of any material which will answer as a base for artificial teeth. The first successful appliance I ever made was constructed with a piece of hard rubber to fill the anterior part of the fissure and the velum attached to it. At the American Dental Convention of 1863 I exhibited a duplicate of this appliance, together with another, the anterior part of which was of hard rubber, but in very many cases hard rubber is entirely inadmissible. Within the past six months I have had half a dozen patients where the fissure did not reach the posterior edge of the palatine bone; the introduction of hard rubber in such cases would be simply preposterous.

In conclusion, let me suggest to those who are willing to undertake experiments in this direction, that they become thoroughly conversant with the scientific requirements of the case, and what has been previously accomplished, before they rush into print with improvements which have been thoroughly tested and rejected long before.

The mechanism of articulation I do not perfectly understand, and I presume I have given as much patient investigation to this subject as any man living. It is a very easy thing, at the present advanced stage of mechanical and artistic skill, to make an appliance which can be worn in the fissure with comparative comfort, but it is a very different thing to make an apparatus which shall fulfill all the demands of the mechanical function of articulation. Improvement in one or two cases proves conclusively but little.

DENTIFRICES.

BY DR. C. E. FRANCIS.

Read before the Brooklyn Dental Association, April 4th, 1866.

FROM *dens*, a tooth, and *fricaro*, to rub.

This term is applied to preparations used for cleaning the teeth and tending to their preservation. Numberless preparations under the name of dentifrices have been spread before the public, and numerous have been the substances employed in their manufacture.

Nearly every pharmaceutist in the land has from one to a dozen preparations for the teeth to offer his customers, and every vender of cosmetics has some favorite nostrum to recommend. They are in the form of *powders*, *pastes*, *soaps*, and *lotions*. Many of these preparations are undoubtedly of benefit to those who are in the habit of using them, and many of them perhaps do more mischief than good. How long a period dentifrices have been in use, I am not able to say, but we find formulas for tooth-powder in very antiquated works. Like most of the old order of prescriptions, these at the present time look somewhat absurd. Many of you probably have noticed an old formula quoted by Goddard in his "History of the Teeth." For the benefit of those who have not seen it, I will repeat it; so if anybody present desires to copy for future use, he can now have the opportunity of doing so. It reads thus:

"Take the head of a hare and three mice; burn and reduce them to powder, and mix with an equal weight of powdered marble." Here, says Goddard, you have animal charcoal and prepared chalk with a vengeance. This prescription is said to be over two thousand years old, and is claimed as having originated in the fertile brain of old father Hippocrates. There are many prescriptions of more modern date which seem equally ridiculous. Even in Harris' works we find a curious compound known as "Beaumer's Dentifrice." It is this: Take of powdered pumice-stone, red earth, and prepared coral, āā ℥i; dragon's blood and cream of tartar, āā ℥ss; powdered cinnamon, ℥ij; cloves, grs. xxv. M. The same author also gives us a formula for what he terms an *aromatic* powder, composed of Peruvian bark, powdered galls, chalk, and orris root, in nearly equal proportions. I imagine the galls and Peruvian bark a decidedly aromatic preparation, well calculated to tempt children to use freely. I will quote one other from Harris, called "Lelande's Electuary Dentifrice." Take of pumice-stone, dried bones, and red coral, āā ʒij; calcined alum, orris root, and powdered cinnamon, āā ℈ij; rock alum and cochineal, āā ʒi. Add to this abomination a sufficient quanity of Narbonne honey to make a thin paste. Allow it to ferment forty-eight hours, and flavor with tincture of musk and cloves. Goddard gives a formula from Prof. Hufeland: Peruvian bark, ℥i; red sanders, ℥iv; and alum, ʒi. Flavor with oil of lemon.

A detersive powder from the celebrated Maury reads thus; Magnesia carb., lbi; cream tartar, lbi; sulph. quinia, ʒv; cochineal, ℥iss; ol. pip. m., ʒiv; oil cinnamon, ʒiij; neroli, ʒij. M.

A "Polish Dentifrice" contains ammon. mur., powdered catechu, myrrh, Peruvian bark, and orris root. This would be so agreeable to the taste that I would advise you all to import a quantity at once. I might give you prescriptions for dozens upon dozens of dentifrices that have been recommended by as many different individuals who have prepared them, did I think you would be benefited by such a rehearsal. It may not be amiss, however, to give a list of the various substances which enter into their combination. I will name them alphabetically. Alum, bole Armen., ashes of tobacco, ammonia mur., borax, bone dust, bark, red, pale, and yellow, Quillia bark, bismuth, benzine, chalk, charcoal, cuttle fish, camphor, catechu, cochineal, carmine, cardamoms, cinnamon, cloves, cream of tartar, coral, dragon's blood, galls, gaultheria, guaiac, honey, krameria, kino, lime, magnesia, myrrh, orris root, oyster shell, pellitory, pumice-stone, soap, white and Castile, soda, salt, sugar, red sanders, red earth, rose pink, tannin.

Some of these substances are but seldom used, and many others are of little account. The most popular substances, or those in common use for powder, are orris root, yellow bark, gum, myrrh, chalk, and soap. These few articles, combined in various proportions, probably form the substance of at least two-thirds of all the tooth-powder used.

Tooth pastes are usually composed of orris root, pumice, chalk, etc., combined with honey. A once famous, but repulsive-looking, compound, was charcoal and honey, and it worked wonders in its own peculiar way, as we shall presently see. The most popular lotions are of the saponaceous order and highly flavored. The old order of mouth-washes were generally composed of tincture of myrrh, bark, camphor, etc. The everlasting sozodont, which is advertised on every fence and rock for fifty miles around us, is supposed to be an aromatic tincture of Quillia saponaria, or soap bark, from an evergreen tree growing in Chili. Of course I cannot say positively that it is such. However, a very nice lotion may be prepared from this bark; but just allow me to say at this point, that pure, sweet *soap* is fully equal to any *fluid* preparation that has ever been prepared for cleansing the teeth. But soap alone is not all that we desire. It has not sufficient body for a perfect dentifrice. The same may be said of all fluid preparations.

In forming a dentifrice we have several things to consider. Admitting that some preparation of this sort is required, let us see what will best subserve our purpose and present the least number of objections. In the first place, tooth-powder should be pleasant to the taste, that it may be used freely by both old and young. It should also be as nearly *soluble* as possible. I contend that charcoal, pumice-stone, cuttle fish, and simi-

lar substances are unfit for common use. The harsh, insoluble particles are forced between the teeth and beneath the margin of the gums, forming a base for the deposit of salivary calculus, which as it concretes severs the membranous connection. The gums are thus kept in an irritated condition; the alveolar process becomes exposed to the action of destructive agents, consequently absorption takes place; the teeth loosen and fall out. I have known cases where particles of charcoal have remained imbedded beneath the surface of the gums for upwards of five years after its use had been abandoned. So much for gritty substances.

Now as regards Peruvian bark and gum of myrrh. They are less objectionable, but I think their properties in this connection much overrated. We do not need them in tooth-powder. They are unpleasant to the taste, bitter. Being insoluble in water, you get little or no medicinal effect; and where a medicinal preparation is desired, have a suitable wash prepared, adapted to the particular case, to be used in connection or alternately with the powder.

The best *base* for tooth-powder is pure precipitated chalk. It is entirely soluble in acetic acid. Borax is one of the very best of ingredients to combine with it. It tends to allay irritation of the mucous membrane, and imparts a peculiar sweetness to the mouth.

A simple and very excellent dentifrice may be made of prepared chalk and old white Windsor soap finely powdered, about six parts of the former to one of the latter. My own favorite dentifrice, which I both use and recommend, is simple and pleasant to the taste, and seems to answer every purpose that can be expected of a dentifrice for everyday use. It is this: ℞ creta preparata, lbsiij; powdered borax and orris root, lbi; cardamom seeds, ℥ij; white sugar, lbi. Mix. Flavor with either ol. rose, ol. gaulth., neroli, or jasmine. This of course is a mere matter of taste. If color is desired, one pound of rose pink may be added, and as much less of the chalk used. Tooth-powder should be thoroughly triturated in a Wedgewood mortar, and finely bolted. The objects of its preparation and use are, to keep the teeth perfectly clean, to neutralize any fermented matter secreted in the interstices; to allay irritation of the gums, and to correct fetid breath. It should be used sufficiently often to keep the mouth in good condition, even though it be once or twice a day. Prepared in a simple manner no fears need be entertained that the teeth will wear out from its frequent use. As it dissolves readily, it must of course be used as dry as possible, and will keep best in well-stopped glass jars. That there is a necessity for a good and suitable dentifrice (in this present generation) to assist in the preservation of human teeth, very few close observers will deny. My own observation has led me to believe that scarcely any person can have a clean mouth without its use. I know that it is argued by those who differ from me in this respect, that horses, sheep, and cattle do not require the use of a dentifrice to keep their teeth from

decay or to insure them a sweet breath. This argument, so far as it goes, is very good, but it does not answer in our case. Horses and sheep do not live on hot mixed food as do their more enlightened masters, neither did their progenitors crave such unnatural diet. They also possess by inheritance a good sound set of masticators, and if they could follow out their own natural inclinations would so live as to keep their teeth and whole physical organization in a state of perfect health.

Do you not suppose that if our domestic animals, and their progenitors for a thousand years back, had been compelled to resort to the same sort of diet that we and our ancestors have so long indulged in, that they would also be cursed with rotten teeth and foul breaths? Examine the teeth of a poor cow that has been fed on hot distillery slops for even a few short years, you will find a very different mouth from that possessed by an animal who takes the cool, fresh grass from a country meadow. Look into the mouths of the many little children who daily enter our offices, and what do we behold? Children at ten, six, or even three years of age; their little "pearly gems" appear more like a miniature array of mouldering tomb-stones, dilapidated, jagged, and broken; frequently emitting an odor so foul as to compel one to stand at a respectable distance while viewing the ruins. Look also into the mouth of an adult who pays no attention to the cleanliness of his teeth; notice the discolored remnants of a once perfect set of dentures; see the huge scales of calcareous deposit encircling the necks of the teeth, or nearly investing their entire crowns; observe the tumid condition of the gums, and how the filthy calculus has forced them to recede, and it is no *wonder* they recede at the approach of such an offensive accumulation. I do not say that the use of a tooth-brush and dentifrice will positively insure the teeth against decay, but a habitual cleansing process will greatly prolong their existence. I have heard it asserted that teeth are *worn out* by being cleansed. Even were this so, they had better wear out than rust out, or, as the old saying reads, "die clean if you will not live clean." But this is not apt to be the case. I have seen but a very few persons in my whole life whom I could conceive had injured their teeth by too much brushing, but have seen hundreds upon hundreds whose teeth were going to utter destruction from lack of care and tidiness. I do not believe in straining at the gnat and swallowing the camel. *Cleanliness*, gentlemen, *cleanliness* is next to godliness. Teeth should be brushed night and morning, particularly at night, for it is during the night that teeth are most ready to decay. During the day, the movements of the tongue, the fresh secretions of saliva, and the act of mastication, all tend, in a measure, to preserve the teeth; but during the night, little or no saliva is secreted, and particles of food filling their interstices being so long subjected to a moist and heated condition, rapidly ferment, and the fluids of the mouth are thus vitiated, inducing disease and decay.

GAS AND INHALERS.

BY O. A. JARVIS, NEW YORK.

It is truly astonishing that either the professions or the people will use the nitrous oxide gas so extensively and so recklessly, when the fact is so very patent that almost absolute ignorance is the rule in regard to the general subject. The mass of those who use it are most profoundly ignorant of its history and chemistry. But even among those who have given the subject the most attention, there is very little agreement or apparent understanding concerning its anæsthetic or hygienic properties and its *modus operandi.* I do not claim to be in advance on these points, and shall only aim to call attention to some more practical features of the subject.

It would be tedious and unnecessary to detail how I found things when commencing the administration of nitrous oxide. I can better impart what little I possess by speaking of the present modes of preparing and using the gas.

First. Anæsthesia is a terribly abnormal condition for a patient to be in, and to suppose there is no danger is madness and folly. Be careful then at every step. Obtain the nitrate only from well-approved manufacturers. But it is unreasonable and absurd that I (as an illustration) should be required to test every batch procured, or that my individual judgment should be trusted. Evidently it should be manufactured under the supervision and approval of proper legitimate authority, emanating from the dental, or, more properly, the medical profession. I urge special attention to this point, and am sure it cannot long be ignored.

Secondly. In making the gas (to state it *very* briefly), it is necessary to wash it only through water, and not to use caustic potash, or any other solution, because of their uncertain effect upon the apparatus, and especially upon the gas. The gas should be made as slowly as possible; overheating is sure to injure it materially. While fresh, and possessing a peculiar odor that belongs to it then, it should not be used. Simply by standing over water, it becomes almost odorless, at which time only is it fit to use. If well secured in a metallic receiver, it does not become stale; certainly not for many days. But it cannot be kept in wood or rubber for an hour, without materially deteriorating by exosmose and endosmose action.

Thirdly. Those inhalers, by which the same air is breathed over and over, are simply abominable, and it is a disgrace for any one to persist in giving the gas in such a manner. Yet it is the general plan. Until recently, no other could be obtained. There are now a number in the market, and others coming of different patterns. One is now on exhibition at White's depot, in this city, constructed somewhat on the plan of a double-barreled gun, conducting the gas directly into the mouth before it can get into the escape tube.

But *the* apparatus *par excellence* for the administration of nitrous oxide gas is the nose-piece. By a similar plan of double orifices for each nostril, the gas is conducted into the nose, and passes directly to the lungs. This is a simply constructed, light, neat, and perfectly fitting piece, and works charmingly. There are many advantages obtained by giving the gas through the nose. The mouth may be opened at any stage, and breathing through it easily prevented, permitting the operation to be continued *ad libitum.* Given in this manner, there is no change in the complexion or the eye, no rigidity of muscle, the patient generally being as quiet as a sleeping babe; the average dose of gas is about three and a half gallons.

REUNION AND REPLACEMENT OF LOST TEETH.

BY J. M. DAVIS, TRENTON, N. J.

SEEING an article in the DENTAL COSMOS for June on the "Replacement and Reunion of a Lost Tooth," my own experience in that way was brought to my mind.

Some fifteen years ago, a young man, then a student of Princeton College, was brought by his father to my office with three of his front upper teeth completely driven up in his jaw—the two central and one lateral. The bone being somewhat fractured, I concluded, after an examination, to extract the teeth; then with my thumb and finger I pressed firmly back in its place the fractured bone, and replaced the teeth in their respective sockets, fastening each with ligatures to a strip of silver, which I had previously clasped to the bicuspid teeth, securing it with ligatures to the eye teeth. I then recommended the use of diluted tincture of myrrh, and in three weeks removed the band and ligatures, the teeth being firmly fastened in their places.

The young man is now practicing law in one of our courts, and I doubt the ability of any man to point out the teeth that were replaced.

Case 2.—An Irishman, working in a foundery, had the two front upper incisors knocked out by a piece of iron; I put them back in their places and pressed the bone firmly around them, fastening them with ligatures to the lateral incisors. They became good, firm teeth again.

Case 3 was an American of powerful frame and muscle and great solidity of bone, teeth so firmly set as to make a dentist hesitate about attacking them.

Having the toothache in one of his superior molars, he called on his family physician to have it extracted. The doctor, since dead, not being a modest or timid man, as most dentists are, boldly seized hold of the offending member, and with Herculean exertions of in and out, backward, forward, and downward, succeeded in removing it; but his triumph was of short duration, for in his extraordinary efforts to remove

the tooth, he had, when the tooth came out, struck the front under teeth, breaking one off close to the gum, and knocking two others completely out, splitting off a large piece of bone which adhered to them. The man was brought to me by the M.D., and after extracting the broken root, I replaced the other two teeth in their sockets, pressing the bone home, and with a band of silver and ligatures treated the case the same as Case 1, with success.

REPORT OF THE COMMITTEE APPOINTED BY THE BROOKLYN DENTAL ASSOCIATION TO EXPRESS TO MANUFACTURERS OF ARTIFICIAL TEETH THE WANTS OF THE PROFESSION.

Mr. President:

Your Committee having duly considered the matter set before them, beg leave respectfully to report the following:

We acknowledge with pride and gratitude the great improvements made by American Manufacturers of Artificial Teeth, yet many defects exist that require correction; among which are the following:

1st. They have not the bony or tooth-like appearance of the natural organs.

2d. The colors are cold; are *not* well blended, and there is a total absence of neutral tints.

3d. They are *not* copies of the anatomical forms of natural teeth.

4th. The anterior approximo-cutting angle of superior laterals is too generally sharp instead of rounded, as in nature.

5th. The incisors are defective in strength.

6th. The superior laterals are too narrow.

7th. The canines in superior sections are not prominent enough; require to stand more outwardly, especially at the points; they do not point forward sufficiently toward the mesial line, and they are not relatively the proper color.

8th. The bicuspids are too prominent, and they and the molars have too little triturating surface.

9th. The bucco-grinding angles of inferior molars and bicuspids are not sufficiently obtuse, on account of which we are often compelled to grind off their buccal cusps, and thus mar the work.

10th. Entire dentures do not articulate properly.

11th. Most of the sections have a mechanical stiffness, and describe too much of a horseshoe curve.

12th. We can rarely find teeth suited to elderly persons with worn cusps.

13th. The incisors are generally too thick and clumsy, and the pins inserted too far from their cutting edges, consequently teeth are broken in use. In narrow teeth, like the incisors, the pins should be placed parallel with the length of the teeth, for the sake of greater strength.

The gums present the following defects, namely:

1. Insufficient prominence over the canines.
2. Too great prominence over the laterals.
3. Too great convexity over all the anterior superior teeth.
4. The gum between the superior teeth approaches too near the cutting edges.
5. The upper edge of the gum of superior sections is not sufficiently depressed over the mesial line for the accommodation of the frenum, and also over the region of the bicuspids.

Your Committee also offer for your adoption the following resolution:

Resolved, That we unite in assuring manufacturers of artificial teeth of our conviction that whoever shall succeed in meeting the demands of intelligent patients and cultivated dentists will be generously rewarded, and will confer a lasting benefit upon his fellow-men.

J. M. Crowell,
J. S. Latimer,
B. W. Franklin.

PROCEEDINGS OF DENTAL SOCIETIES.

MASSACHUSETTS DENTAL SOCIETY.

The annual meeting of the Massachusetts Dental Society was held at the rooms of the Suffolk District Medical Society, in Perkin's Building, Temple Place, yesterday forenoon. In the absence of the President, Dr. N. C. Keep, the Vice-President, Dr. E. J. Leech, called the meeting to order. Some fifty members were present from various portions of the State. The opening session was mostly devoted to clinical operations upon different subjects, performed by N. C. Keep, M.D., of Boston, President of the Society; H. F. Bishop, D.D.S., of Worcester; I. J. Wetherbee, D.D.S., of Boston; L. D. Shepard, D.D.S., of Salem; Dr. E. G. Leech and Dr. I. A. Salmon, of Boston.

The reports of the Treasurer, Secretary, and Executive Committee were presented.

The following were elected officers:

President, N. C. Keep, M.D., of Boston; *Vice-President*, Dr. E. G. Leech, Boston; *Recording Secretary*, L. D. Shepard, D.D.S., Salem; *Corresponding Secretary*, E. C. Rolfe, M.D., Boston; *Treasurer*, S. J. McDougall, M.D., Boston; *Librarian*, E. N. Harris, D.D.S.; and an Executive Committee of five.

Dr. Bishop, of Worcester, was elected to deliver the next annual address.

Dr. I. J. Wetherbee, of Boston, then delivered the annual address. He spoke of the condition and prospects of the dental profession. The monthly meetings of the Society had been well attended. The discussions at these meetings had developed the fact that too little knowl-

edge in the past of the best modes of practice existed, but professional silence, he was glad to say, has run its course. He urged the importance of practitioners graduating at a dental college, and the need of a dental college course. The dental colleges in operation have exercised an important influence in redeeming the profession from a mere nondescript, as it were, and furnished the world with scientific dentists. He wanted to see a dental college established in Boston. He criticised the practice of some dentists charging low rates and doing poor work. He advised the frequent holding of clinics as the best means of demonstrating the best modes of practice, and decried the turning out of "yearlings and unfledged dentists." At the close of the address, which was an able production, it was voted to publish it for the use of the Society.

A committee of five was then appointed to make arrangements for entertaining the American Dental Association, to be holden in Boston, commencing July 31st.

The following gentlemen were elected as delegates to said Association: Drs. N. C. Keep, E. G. Leech, E. N. Harris, T. H. Chandler, T. B. Hitchcock, O. F. Harris, W. L. Bowdoin, E. C. Rolfe, S. G. McDougall, G. T. Maffit, A. A. Cook, and J. M. Daily.

The Society then adjourned to the Tremont House, where the annual dinner was discussed, after which speeches were made by Dr. A. A. Gould, President of the Massachusetts Medical College, Dr. Keep, President of the Society, Dr. Horne, of Watertown, and others. Dr. Wetherbee, orator of the day, spoke briefly in response to calls, on the advantage of dental knowledge to mothers, and gave instances which had passed under his observation. Dr. Leech contrasted dentistry of to-day with that of thirty years ago, noticing the improvements that had been made. Dr. Page offered some remarks, and closed with a sentiment complimentary to the Society. Remarks were also made by Dr. Sheldon, of the Massachusetts Medical Society, Dr. Harris, the former Secretary, Dr. Palmer, of Fitchburg, Drs. Page, Hitchcock, and others.

The Society then repaired to one of the parlors, and after transacting some business of a minor character, and discussing the modes of filling teeth, adjourned.—*Boston paper.*

ODONTOGRAPHIC SOCIETY OF PENNSYLVANIA.

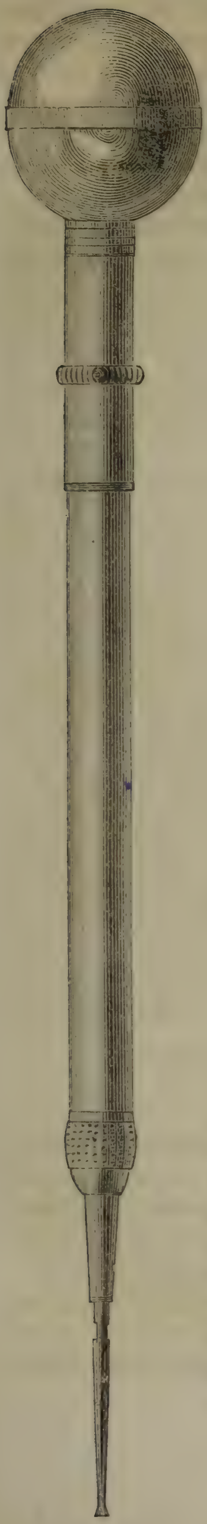
BY THOS. C. STELLWAGEN, D.D.S.

A MEETING was held Monday, June 4th, 1866, in the Philadelphia Dental College.

The President, Dr. Jas. M. Harris, in the chair.

Dr. Jas. McManus, of Hartford, Conn., was unanimously elected a corresponding member.

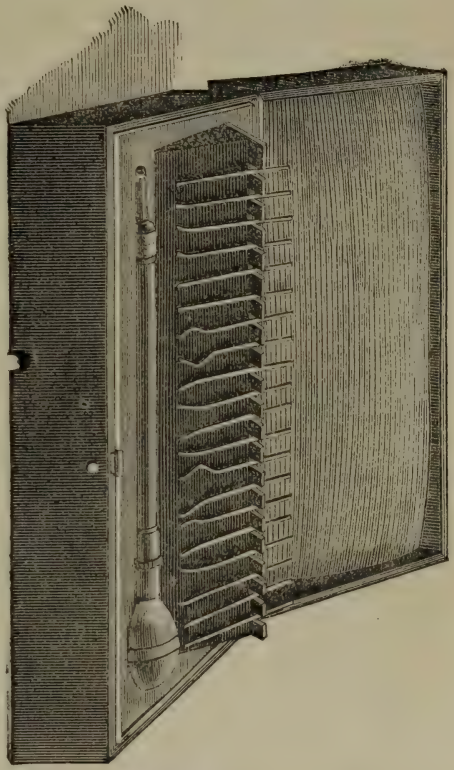
A copy of the Transactions of the Connecticut State Dental Associa-



tion was received, and placed in the library, and a vote of thanks tendered to the Association.

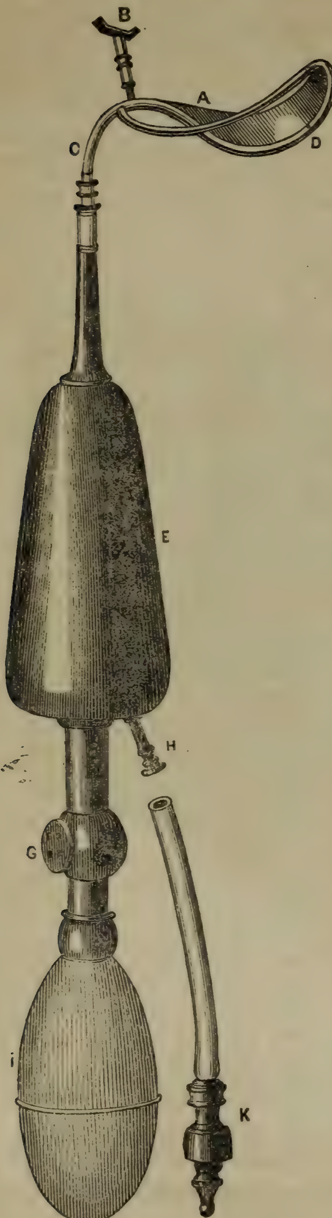
The picture of John Tomes, F.R.S., was exhibited, with a neat frame, as ordered to be purchased by the Society, and the committee was discharged after receiving a vote of thanks.

A new automatic plugger, invented by Dr. Foote, was then exhibited to the Society.



Dr. Stellwagen said that he had been using a similar instrument for some time with great satisfaction to himself and patients, and he considered it the most perfect instrument of the kind that he had tried; indeed, he was so much pleased with it that he had ordered one to be made for himself with a slight alteration in the socket, so as to fit some bits that he had. He also called the attention of the Society to the rack for holding the bits, being a most neat and convenient way of keeping them in order, and changing with the same hand as that used in operating.

Dr. W. H. Dibble, of Bordentown, N. J., then exhibited his Saliva Pump, and offered the following explanation:



The object of this instrument is to facilitate the operation of filling teeth by keeping the mouth free from saliva, and as a means of holding the tongue away from the teeth, also a means of supporting the upper jaw, and so assisting the muscles which keep the mouth open. The several devices by which these objects are attained comprise one instrument.

A designates the plate which keeps the tongue away from the teeth; B, the arm which supports the jaw; C, the silver tube and bow which fit over the jaw; D, the opening where the saliva enters the tube; E, the chamber that receives the saliva (made of hard rubber). A vacuum is made in the saliva chamber E by the pressure of the bulb I, thereby causing the saliva to flow into the opening D. H, the tube where the saliva is discharged; G, the exhaust valve; K is a valve with an elastic tube attached, which can be connected to the tube H, and so carry to the spittoon in lengthy operations.

It was then proposed that the Society should discuss the different methods of keeping cavities dry during operations. On motion, this was adopted as the subject for the evening.

Dr. McQuillen preferred, under all circumstances, to introduce a filling perfectly dry, but considered it was better for a tooth to be filled even with a slight amount of moisture in the cavity, rather than to leave it to the uninterrupted ravages of decay. As a general thing, he had not suffered much inconvenience from the presence of saliva, as the means at

hand were sufficient to meet ordinary emergencies. Thus with the aid of a strip of muslin under the lip or cheek when operating on the upper jaw, or under the tongue on the lower jaw, the salivary secretion, as a general thing, was so completely absorbed that no trouble ensued from the presence of moisture; the only inconvenience experienced was due to the necessity of frequent removal and renewal of the strips in some cases.

He was in the habit, when operating on the upper jaw for persons troubled with an excessive flow of saliva, of stopping in the midst of an operation when the mouth became filled with the saliva, and requesting patients to void it into the spittoon without closing the mouth; during this process, the tooth operated upon was protected from moisture by a napkin or piece of muslin placed over it and held in position by the fingers of the operator. In cases such as this, he had reason to believe that Dr. Dibble's apparatus would prove a valuable invention, particularly in operating upon the lower jaw.

Dr. Dibble uses sponge gold, and finds that if moist it will not work to his satisfaction. He has in two cases put $\frac{1}{8}$ oz. in lower molars when using this instrument; during these operations he thinks the glands probably discharged about six ounces. He did not consider that the flow of saliva was as much increased as by the use of the napkin in the mouth, and believed this instrument to be more satisfactory to the patients. He then diverged a few moments to explain how sponge gold was prepared.

Dr. Breen felt happy to see an instrument that appeared to answer the purpose of removing the saliva so well. He deemed it a most important and necessary precaution to prevent a filling from being damped while being introduced, and felt that any means which served to assist in the attainment of this end should be carefully attended to.

Dr. Harris compared the little glands and ducts to sentinels placed on guard over the mouth, who, upon the approach of foreign bodies, gave their warning. Indeed, they seemed sometimes aware of the part irritated, he having frequently seen them discharge the saliva upon the very point irritated.

Dr. Stellwagen said he had often struggled with this foe, and no doubt others present could give precisely the same experience as his own. His most familiar weapon, when combating the common enemy, was a clean white napkin, or strip of linen. But at times he had found this but a poor defense; and even when aided by bibulous paper laid in folds over the mouths of the ducts of Steno, of Wharton, and the orifices of the smaller glands under the tongue, these covered with napkins, and the whole held firmly in position by a tongue-holder, he had been forced to acknowledge the triumph of the saliva, which, oftentimes kept under by the ordinary saliva pump, would still in some cases rush into the breach and compel the withdrawal of the gold. Then came the necessity to make another

appointment, choosing, if possible, some more auspicious time, or else to bid the patient wash out the mouth for some time with cold water, or an astringent wash to depress, if possible, the activity of the secretory glands; after which to get the patient to suck the mouth, and permit the wiping dry with a clean napkin preparatory to another trial. Sometimes this careful commencement would succeed, and particularly when aided by the judicious and skillful removal of the absorbers; indeed, in the operations upon the superior teeth it seldom if ever failed.

Where the cavity was an approximal one, and the adjoining tooth was in position, he frequently used a wooden wedge between, or sometimes a small piece of paper or cotton, these keeping back moisture from the free margin of the gum. In operations upon the inferior teeth, and sometimes the superior, he had used the coffer-dam of plaster of Paris, but for some time had almost abandoned its use; he then tried the rubber-dam, and in many cases thought it a "sine qua non," but it had been his misfortune on several occasions, after having introduced some considerable amount of gold into a tooth, to find himself the loser; a motion on the part of himself or patient having tripped the rubber-dam, it would fly off with a defiant snap, and that which perhaps took ten or fifteen minutes to adjust was rendered useless, and in fewer seconds the work of perhaps an hour would be irredeemably lost. He, under such circumstances, felt that the dam could be looked upon as a fine trap for the destruction of the utility of gold and labor.

In conclusion, he would say that there might be others who had been more successful in their encounters with this adversary, but he had at times been forced to act upon the principle expressed by his friend, Dr. McQuillen, that a filling introduced partially moist was better than none at all. The instrument exhibited this evening would be a valuable adjunct, and he could but move that the Society tender its thanks to Dr. Dibble for his invention, which motion was unanimously carried.

The Recording Secretary, Dr. Stellwagen, then called the attention of the Society to the necessity of electing delegates at this meeting for the American Dental Association, which was entered upon, and resulted in the unanimous choice of the following members:

Dr. Jas. M. Harris.
Dr. Thos. C. Stellwagen.
Dr. J. Foster Flagg.
Dr. G. C. Loar.
Dr. Jas. E. Garretson.
Dr. A. B. Robbins, Meadville.
Dr. J. L. Suesserott, Chambersburg.

The Society then adjourned to meet in the same place on Monday, September 3d, 1866.

CONNECTICUT STATE DENTAL ASSOCIATION.

BY J. H. SMITH, D.D.S., NEW HAVEN, RECORDING SECRETARY.

THIS Association commenced its session at Tyler's Hall, on Tuesday morning, May 15th, at eleven o'clock, Dr. A. Hill, President of the Society, in the chair.

The following are the officers elected for the ensuing year:

President, J. T. Metcalf, New Haven; *Vice-President,* W. W. Sheffield, New London; *Recording Secretary,* J. H. Smith, New Haven; *Corresponding Secretary,* Samuel Mallett, New Haven; *Treasurer,* E. E. Crofoot, Hartford; *Librarian,* James McManus, Hartford; *Executive Committee,* J. A. Riggs, Hartford; E. E. Crofoot, Hartford; John Cody, Hartford.

Mr. L. C. Smith extended an invitation in behalf of the New Haven Dental Association, that the members partake of a supper at the Tremont House. They then adjourned till two P.M.

FIRST DAY—*Afternoon Session.*

Dr. Hill, on the assembling of the Society, read a brief communication on retiring from the position as President of the Society, in which he incorporated an address that was sent to the officers and faculty of Yale College, for the establishment of a department of dental surgery in connection with the medical course of instruction. It was a fine argument for the establishment of such a school for the branch of surgical science desired. In reply to the address, President Woolsey said that he would lay the matter before the corporators of Yale, at the next meeting in July, when it should have a favorable hearing.

Drs. N. B. Welton, of Cheshire, Charles A. Powers, of Hartford, A. B. Smith, of New Haven, and J. D. Riggs, of Hartford, were elected members, and Dr. J. A. Perkins, of Albany, an honorary member of the Association. Dr. Isaac Woolworth, of this city, read a very acceptable essay on miscellaneous subjects of dentistry and health.

The President stated that the first subject for the consideration of the Association would be "The Treatment of Sixth-Year Molars prior to the Fourteenth Year." It was discussed by Prof. Atkinson, of New York, Sheffield, of New London, Hill, of Norwalk, Mallett, of New Haven, and others. The meeting adjourned to nine o'clock Thursday morning.

SECOND DAY—*Morning Session.*

Norwalk was designated as the place of the Society's next meeting on the third Tuesday of October.

Drs. S. T. Clemens, of Norwalk, and Hitchcock, of Hartford, were then constituted members of the Society.

Prof. Sprague, of Boston, was then introduced to the Society, and, by invitation, proceeded to explain his method of making nitrous oxide gas. He used for the purpose of generating it a somewhat complicated chemists' retort of large size, and the action of the gas on the subject was rapid, agreeable, and entirely harmless.

The discussion on the treatment of six-year old molars was then resumed, and Drs. Riggs, Perkins, Sheffield, Atkinson, Mallett, Woolworth, and Hill participated in it.

SECOND DAY—*Afternoon Session.*

The thanks of the State Society were tendered to the New Haven Society for their generous hospitalities at the Tremont House.

Discussions on "Nitrous Oxide Gas" followed, in which Prof. Sprague, and Drs. Scranton, Hurd, Riggs, Longstreet, Smith, Stevens, and J. H. Smith participated.

Drs. E. S. Gaylord, of New Haven, and J. A. Dibble, of Milford, were elected members.

Prof. Atkinson then addressed the Society. Shortly afterward, adjournment came. The Society had a decidedly happy and profitable time in the City of Elms.

EDITORIAL.

NEW YORK COLLEGE OF DENTISTRY.

THOSE members of the dental profession who recognize that a collegiate education on the part of the young men now entering its ranks is absolutely indispensable, not only for the good of the community, but the advancement of the science and art of dentistry, will be pleased to know that the above institution has succeeded in forming a faculty, and that a regular course of lectures will be delivered next winter in the City of New York. In entering upon the discharge of their duties, the members of the faculty will have the best wishes of every one interested in the cause of education; and able, earnest, and persistent efforts on their part, cannot but meet with due reward. J. H. M'Q.

DECEASE OF ASAHEL JONES.

As we go to press, information comes of the sudden death, from the effects of the heat, of Mr. Asahel Jones, widely known to the dental profession, formerly one of the firm of Jones, White & McCurdy. Further particulars will appear in the next number of the DENTAL COSMOS.

S. S. WHITE.

PERISCOPE OF MEDICAL AND GENERAL SCIENCE IN THEIR RELATIONS TO DENTISTRY.

BY GEO. J. ZIEGLER, M.D.

"*On Certain Painful Affections of the Fifth Nerve.* Delivered before the Medical Society of London, Session 1865–66. By FRANCIS E. ANSTIE, M.D., London, Fell. Royal Coll. of Physicians, Senior Assistant Physician to the Westminster Hospital.

"LECTURE I.—*Mr. President and Gentlemen:* The title which I have adopted for the course of lectures you have done me the honor to ask me to deliver is intended to direct attention to a feature in the observations on which they are based which I believe to be to some extent novel. By 'painful affections of the fifth nerve' it will be perhaps supposed that I mean to designate only those affections which come under the recognized title of 'facial neuralgia;' but my design is to show that the latter term, in its ordinary conventional use, is injurious, by reason of its separating a certain group of maladies far too sharply from others which are truly cognate with them. I wish to convince you that the typical 'neuralgic' affections of the trigeminus, which are most characteristically exemplified by severe tic douloureux — the 'tic epileptiforme' of Trousseau — are closely allied to some other disorders, in which the nerve-pain is a far less prominent symptom, in virtue of certain secondary phenomena, certain facts of clinical and constitutional history, and certain analogies in regard to the influence of remedies, which are common to the whole series. I shall advance arguments which appear to indicate that a common element of causation (and this the most important one) belongs to the whole group; and that this element consists in an organic change in certain portions of the nervous centres—a change which, however difficult to identify by naked eye or microscopical examination of tissues, betrays itself distinctly by secondary phenomena which could only have originated from such a source. These arguments will be of three kinds: the first will consist of certain facts which are now known with regard to the anatomical and physiological connections of the nervous centres in question, and the evidence (such as it is) which morbid anatomy affords as to the results of physical changes in them; the second will include the clinical history of the diseases of which I am about to speak, with special reference to certain complications which have not yet attracted the attention which they deserve; and the third will consist of facts respecting the hereditary transmission and transformation of nervous diseases which have not as yet been brought to bear with their legitimate force upon the solution of many questions which embarrass us with regard to the pathology of facial nerve-pain.

"Our first subject of consideration will naturally be the healthy physiological anatomy of the trigeminal nerve. Referring you to the diagrams before you for mental refreshment as to those more elementary details of the distribution of the small motor portion and the large three-branched sensory division of the fifth cranial nerve, which may have momentarily escaped the recollection of some, let me remind you of certain facts, less obvious, but equally important. The large sensory division of the nerve (which corresponds with the posterior root of a spinal nerve)

has its origin in certain nuclei of the medulla oblongata, and forms connections, more or less intimate, with the roots of certain other nerves, especially the facial, the auditory, the pneumogastric, the glosso-pharyngeal, and (in a less marked degree) the spinal accessory. It has also extensive connections with the olivary and restiform bodies, and arciform fibres from these pass through it into the median raphé of the medulla. New groups of ganglionic cells arise in the sensitive root of the trigeminus wherever fresh radiations are found, or new connections with other nerves are established—an important fact with reference to reflex function. The three great divisions of the sensitive trunk of the fifth nerve spring from the front of the Gasserian ganglion—an organ which is the analogue of the ganglia of the posterior roots of spinal nerves. These three great branches, the ophthalmic, superior maxillary, and inferior maxillary, which are distributed as sensitive nerves to all parts of the face (both at its surface and in the interior of the eye, the nose, and the mouth; in fact, to the whole region which a craniologist would understand by the word face), form connections with various other nerves, of which connections the most important for us to remember are those with the facial, the hypoglossal, and the ganglia of the cranial sympathetic.

"The functions of the fifth nerve may thus be summed up—1. As a nerve of common sensation to all those facial regions above indicated. 2. As a nerve of special sense, it ministers by its lingual branch to the function of taste; by branches of the second division, more especially to the special tactile sensibility of the lips; and by branches also of the superior maxillary, in a subsidiary way, to the function of smell. 3. As a supporter and regulator of the nutrition of the tissues, to which its terminal branches are distributed. 4. As a conductor of vaso-motor impressions to the blood-vessels of the face. 5. As an excitor of certain secretions, and an inhibitor of others. 6. By its small root, as a nerve of voluntary motion. 7. Finally, as a great channel of reflex impressions between the various important nerves with which it has already been stated to possess intimate connections, either at its central origin, in its course, or at its peripheral terminations. One of the most important of these connections, in a practical view of facial neuralgic affections, is that which the sensory division of the fifth possesses with the motor root of the same nerve (distributed only to the muscles of mastication), and with the portio dura, which has been well shown by Bernard and others to fill the *rôle* of a supplementary motor division of the trigeminal.

"Such is the general summary of function. But it is necessary to be more precise. Dr. Brown-Séquard has recently stated that in all spinal, and also in the cranial, nerves, the law of *isolated conduction of impressions* is carried out by the provision of no less than eleven distinct sets of afferent and efferent fibres, exclusively of those which minister to special sense. Without positively affirming this, we are able to predicate (from the results of experimental sections of the trigeminal, from the consequences which have been observed to follow accidental injuries of particular portions of it, and from the comparison of these facts with the known anatomical structure and connections of the nerve) the existence in it of at least the following distinct channels of conduction. Of *afferents* there are, in the first place, at least two sets of special sense-fibres (those of taste and touch); secondly, there are fibres conveying the sense of pain, and, in my present belief, that of temperature also; thirdly, there are fibres which convey special excito-motor impressions; fourthly, there

are probably fibres which convey impressions destined to affect, in a reflex manner, the secretion of glands, and the nutrition of tissues to which the fifth nerve sends branches; and, finally, there are probably special afferent fibres to conduct certain impressions to be reflected by the vaso-motor afferents. Of efferents there are, firstly, fibres which convey voluntary motor impressions (limited to the small root); secondly, fibres which convey a nutritive influence to the elements of tissues, and which probably also minister to those changes in glands which are the essence of the process of secretion; thirdly, there are special vaso-motor fibres, which are separate from the last group, and can only influence secretion indirectly by altering the calibre of blood-vessels.

"With regard to two of these groups of efferent fibres, the vaso-motor and the nutritive, it is necessary to enter into detail; and in order to do this we must review the successive discoveries which have been elicited by experimental sections of the nerve. [The lecturer here made a lengthened analysis of the successive experiments of Magendie, of Claude Bernard, of Moritz Schiff, and others, on section of the fifth nerve within the cranium.] From these researches it appears that the division of the *whole thickness* of the sensory portion of nerve, at any point between the deep origin in the medulla and the trifurcation, is followed, not merely by palsy of sensation, but also by arrest of nutrition of the tissues of the eye, and even of the face in some cases, arrest or great vitiation of the secretions of the Meibomian glands, vaso-motor palsy, and consequent congestion of the eye, contraction of the pupil, and aqueous flux from the lachrymal gland and the nostril; unilateral thickening (not true hypertrophy) of bone; excessive unilateral growth of tongue-epithelium; alteration of the hair, on the affected side, in the direction sometimes of simple atrophy, sometimes of coarse thickening of the individual hairs. It appears, however, that the vaso-motor and nutritive changes fail to follow a section of the nerve *behind the Gasserian ganglion*, unless this is very complete; whereas a much less complete section, which injures the ganglion itself, is certain to produce these changes in a decided manner. I believe that this somewhat puzzling fact is to be explained by reference to Bernard and Waller's experiments on the ganglia of the posterior roots of the spinal nerves, of which the Gasserian is the analogue. The nutrition of the posterior or sensory root of the fifth, as in the case of a spinal nerve, probably depends on the integrity of its ganglion; and serious lesion of the latter would cause all the fibres of the posterior root to perish—a view which is remarkably supported by the very interesting post-mortem of a case of inveterate *tic* recorded by Romberg, to which I shall refer at a later stage.

"Now it is a remarkable fact, and one which has never been expressed with a force and completeness worthy of the importance of the subject, that many of these phenomena—the characteristic result of entire *suspension* of the influence of the trigeminal in nutrition and secretion—are always reproduced, though with greatly varying degrees of completeness, in cases not merely of severe typical facial neuralgia, but of far less formidable painful affections of the fifth nerve (*e.g.* 'sick headache'), provided that the pain, however excited, always follows the track of particular branches of this nerve. In my own case the successive complications of a neuralgia of the ophthalmic and superior maxillary division, from which I suffered severely, and still suffer occasionally, have included conjunctivitis, ulcers of the cornea, periostitis of the frontal bone, stricture of the

nasal duct, unilateral lachrymation and nasal flux, temporary unilateral blanching of the hair of the eyebrow and scalp, and unilateral furring of the tongue. And I have discovered the still more curious fact, that a narcotic (*i.e.* paralyzing) dose of alcohol, or of one or two other allied substances, is capable of reproducing, in slight degree, both the frontal neuralgia and also several of the secondary complications above named, especially the lachrymation and conjunctival congestion, and the temporary change of color in the hair, on the side which is liable to neuralgic pain: this observation I first made by accident when experimenting on the rapidity of elimination of anæsthetics administered in large doses. I shall remit the further discussion of these points to the section of Etiology; meantime it is extremely interesting to note the similarity of the secondary phenomena attending neuralgia of the fifth nerve on the one hand, and those following actual section and narcotic palsy of the nerve on the other. It is impossible not to believe that the focus of the disordered action which produced such complicated results must have been in the medulla oblongata in all three cases; on any other supposition it would be vain to attempt to account for the remarkable resemblance between the peripheral symptoms (palsy of nutrient and of vaso-motor fibres) occurring from such apparently different causes as nervous headache, narcotic poisoning, and section of the trunk of a cranial nerve. The point which we have here to consider is a physiological one—namely, that a paralyzing narcotic agent which notoriously exerts a toxic influence upon the central portions of the nervous system (and notably on the medulla oblongata, which contains the deep origins of the trigeminal nerve) is capable of producing at one and the same time palsy of nutrient and vaso-motor fibres, and pain in peripheral sensitive fibres of that nerve. We must suppose, at least provisionally, that the other factor in the morbid process was the permanent existence of a weak spot in the structure of the central origins of the nerve on the side affected. At this stage of the argument we are reminded of the fact that it is in its course through the medulla that the trigeminal nerve effects its most important communications with certain other nerves which are the channels of conduction to distant organs, the 'functional' disturbances of which are among the most remarkable complications of painful affections of the fifth nerve. The vomiting which occurs in migraine or sick-headache explains itself by the extension of the morbid action going on in the central origins of the fifth to the origins of the vagus, just in the same way as the morning headache and vomiting of the drunkard are a part of the phenomena of receding narcosis of the medulla oblongata.

"If it can be shown, then, that secondary complications, of the kind which is illustrated by the above examples, are often produced at many points of the periphery of a wide area, whose central point is to be found in the deep origins of the trigeminus, and whose radii are nerves which spring from the neighborhood of, and possess connections with, the roots of the trigeminus, and pass to the organs and tissues in which the secondary disturbances arise, we begin to see the possibility of turning the anatomical and physiological facts now briefly reviewed to a practical account. Namely, it seems possible to form a group of 'painful affections of the fifth nerve' which shall be united by their common possession of this physiological characteristic—that the pain in all of them is merely one symptom of a malady whose focus is the deep origin of the trigeminus, and whose intensity is capable of being estimated no less accurately

by the test of the number and severity of the 'secondary' complications than by the degree of pain manifested in the sensitive branches of the fifth nerve itself. The validity of this classification must be judged of by the evidence to be produced in future lectures, as to the clinical history, the vital status, the hereditary antecedents, and the amenability to particular remedies of the sufferers from the diseases which it is proposed to include in one main group.

"Let us reflect for a moment, in concluding our review of the physiological anatomy of the trigeminus, on the general characteristics of this remarkable nerve as developed *in the human subject.* In the organization of every animal of the vertebrate class, this nerve plays a distinguished *rôle*. But a characteristic of the lower organisms is the union of many functions in one organ; while the higher ranks of animal creation, on the contrary, are distinguished by the elaborate *differentiation* of the organs by which the functions of life are performed. In ascending the vertebrate scale, we note that the trigeminus, which in many lower genera and species is heavily taxed with the functions of *special sensation* [the lecturer here noticed in detail the case of particular fishes, reptiles, birds, and mammalia], is, in the highest organisms, comparatively little concerned with this particular duty As we reach the highest types of the vertebral skull, we find the 'special sense capsules' very rigidly separated from the nerves which convey inward to the centres the impressions of common sensation, of temperature, of muscular sense, etc. The vast peripheral expanse of the trigeminus is thus, in man, mainly devoted to the reception of impressions, which, when they are made with a certain force, are likely to be translated, by the mental perception, as *pain.* To this consideration let us add another—that the nervous centre in which the trigeminus is implanted is, of all nervous centres, the one which in the human subject is most liable to congenital imperfection of the kind which necessitates a break down in its governing functions at special crises in the development of the organism; and we need seek no further for an explanation of the number and severity of the affections which it is the purpose of these lectures to identify and to discuss. In the next lecture I shall invite your attention to the clinical history of these diseases." —(*Lancet.*)

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"*A System of Perivascular Canals in the Central Nervous Organs.*— The last number of the *Archives des Sciences* contains a notice of Herr His's discovery of a peculiar series of channels which traverse the central nervous masses. He first detected them in a number of sections of the spinal cord, in which they were represented by grooves which he looked upon as opened channels. They are more distinct in the gray than in the white substance. Each groove incloses a blood-vessel, which either lies freely within it or is attached to its walls. They are abundant enough in the brain, and this circumstance explains how one is enabled to remove whole vascular networks with the forceps from the surface of the cerebrum. Herr His's injections of these spaces show the perivascular canals to lie between the nervous substance and the pia mater. He concludes that the spaces are connected with the lymphatic system, and thinks them analogous to those reservoirs which in the frog are placed between the integument and the muscles, and which almost completely separate one from the other."—(*Ibid.*)

"*What Ganglia to select for Microscopic Examination.*—In concluding the second part of a valuable memoir on the Structure of the Peripheral Nervous Ganglia, M. J. F. B. POLAILLON gives the student some useful advice as to the selection of ganglia for investigation. The invertebrate animals, he says, are specially suitable for the study of the relations between the globules and the fibres, because the ganglia are so minute that they remain intact. Among the vertebrates, fishes, and especially the plagiostomes (sharks and rays), are most valuable for this kind of research, because of the absence or small development in their ganglia of the intermediate substance, which in mammals, reptiles, and birds unite the cells together, and render the observation of the prolongations so difficult. In the case of birds, mammals, and reptiles, the fœtuses and young animals are to be preferred. As to the choice of the ganglia in any given animal, M. Polaillon says it is always advisable to select the smallest specimens. If it is required to teaze out (*dilacérer*) the constituent parts, one should select the ganglion of the sensitive root of the hypoglossal nerve of the dog. When you wish to make sections in different directions, you may choose the Rachidian ganglion. To examine the small microscopic ganglia imbedded in the tissues, it is best to select the heart of the frog, in which, after the tissue has been made transparent by maceration in dilute phosphoric or acetic acid, these ganglia may be easily seen. The same means may be employed in examining the ganglia of the excretory ducts and of the intestinal canal."—(*Ibid.*)

"*Anæsthesia by Pulverized Ether.*—An article has appeared in the *Gazette Hebdomadaire* of Paris (March 23d), wherein M. Leon le Fort tries to prove that this practice is borrowed from the French. He relies on a passage of the article 'Anæsthesia,' by M. Giraldes, in the now publishing 'Dictionnaire de Medecine et de Chirurgie Pratique.' M. Giraldes says: 'I think that ether or chloroform, pulverized by any of the numerous well-known instruments, especially by Luer's, may yield good results.' This phrase, and perhaps M. Giraldes' experiments, says M. le Fort, remained unnoticed when Dr. Richardson published his article on local anæsthesia in February last."—(*Ibid.*)

"*Local Anæsthesia.* By J. C. B. SMALLMAN, M.D.—I have very great pleasure in stating that the effect produced by Dr. Richardson's anæsthetic spray has not, as far as my experience goes, been exaggerated by any gentleman who has spoken in its favor. I lately applied it to a clergyman's wife, who had a small encysted tumor of the hand. Insensibility of the part was produced in less than a minute, the tumor extracted and the wound stitched up without the lady feeling the least pain. I have tried it in numerous small operations with the same satisfactory result. I once proceeded to extract an upper molar tooth under its influence by directing the spray upon the cheek; but in this case, although the cheek was perfectly blanched and void of sensation, the person evinced pain on removal of the tooth.

"The only drawback to this valuable invention, in my opinion, in suitable cases, is the pain of intense cold before total insensibility of the part operated on results."—(*Ibid.*)

Malformed Teeth from Hereditary Syphilis.—In a letter to the *Cincinnati Lancet and Observer*, DR. A. D. WILLIAMS states that "at

the London Ophthalmic Clinic, syphilitic keratitis is of very frequent occurrence, and usually, when in children, is of the asthenic nature. So soon as the surgeons suspect a syphilitic taint in a keratitis in a child for instance, from five to ten years old, they open the mouth immediately and look at the teeth, and if the incisors have a peculiar dwarfed and notched shape or form, with more or less decay, they do not hesitate to pronounce the disease *syphilitic* in its nature, and of course it is inherited in so young subjects. The surgeons dwell with emphasis upon the diagnostic value of the shape and form of the front teeth in syphilis, and Mr. Hutchinson has published a lengthy and interesting report upon the subject in the Ophthalmic Hospital Reports. The form of the teeth certainly do not reveal an unmistakable specific taint, but may only be regarded as *confirmatory* of *suspected* inherited syphilis."

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Secondary Syphilis from Transplantation of a Tooth.—"JOHN HUNTER, in his Treatise on the Venereal Disease, gives a number of instances of the communication of secondary syphilis, among which is the following case of a gentleman, where the transplanted tooth remained, without giving the least disturbance, for about a month, when the edge of the gum began to ulcerate, and the ulceration went on until the tooth dropped out. Some time after, spots appeared almost everywhere on the skin; they had not the truly venereal appearance, but were redder or more transparent, and more circumscribed. He had also a tendency to a hectic fever, such as restlessness, want of sleep, loss of appetite, and headache. After trying several things, and not finding relief, he was put under a course of mercury, and all disease disappeared according to the common course of the cure of the venereal disease, and we thought him well; but some time after the same appearances returned, with the addition of swelling in the bones of the metacarpus. He was now put under another course of mercury, more severe than the former, and in the usual time all the symptoms again disappeared. Several months after the same eruptions came out again, but not in so great a degree as before, and without any other attendant symptoms. He a third time took mercury, but it was only ten grains of corrosive sublimate in the whole, and he got quite well. The time between his first taking mercury and his being cured was a space of three years.—*The Works of John Hunter, with Notes, edited by James F. Palmer.* Vol. ii. p. 475–76; p. 484."—(*Southern Med. and Surg. Journal.*)

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"*Necrosis of the Lower Jaw from application of Tobacco Oil to a Hollow Tooth; Removal of Dead Bone.* Under the care of Mr. Paget, St. Bartholomew's Hospital.—Smoking has long been a popular remedy for toothache, and we believe the sailor's quid enjoys a stilll greater reputation as a local application under these trying circumstances. In the case to which we now refer, the unfortunate patient, through his application of the remedy in a highly concentrated form, set up inflammatory action, which destroyed a large portion of his jaw.

"An Italian sailor was placed, under the influence of chloroform, upon the operating table on the 26th ultimo. Just under his left lower jaw the skin was ulcerated, and there was a sinus communicating with dead bone. Mr. Paget removed several of the teeth, and then, without making any incision, contrived, with the aid of a strong forceps, to remove several

sequestra representing a portion of the base, the angle, and a large part of the ascending ramus of the left lower maxilla.

"From Mr. Paget's remarks, we gathered that the man, just previous to starting from Australia, three months ago, suffered very much from a carious tooth. To relieve the pain, he introduced into the hollow some of the oil of tobacco which had accumulated in the stem of his pipe. Violent inflammation of periosteum and the surface of bone was set up, ending in death of the osseous tissue. Mr. Paget remarked, incidentally, that there was great uncertainty as to the period at which sequestra were removable. As a general rule, the more acute the necrosis the more rapid the separation of the fragment; so that within three months of acute necrosis one might expect to find the sequestrum loose, as was the case in the present instance.

"The case well illustrates a source of danger which is not generally recognized. The practice of smoking is very widely spread, and foul pipes, as well as carious teeth, are very common. Every smoker of a pipe has been disgusted now and then by sucking into his mouth a few drops of the highly pungent and nauseous product of the combustion of tobacco. In the action of smoking, the tip of the tongue ordinarily receives this deleterious fluid, and is very often blistered in consequence. Were it not for the tongue, one can readily imagine that hollow teeth would often receive this fluid; with what amount of risk the case before us well shows. It is well known that for phosphorus to excite the inflammatory action, which so often affects the lucifer-match workers, the fumes must be applied to a raw vascular surface in immediate connection with the nutrition of bone. This almost always happens through the medium of a carious tooth. There is no reason to suppose that tobacco oil would set up inflammation except under similar circumstances. It is, however, very probable that some cases of acute necrosis of the lower jaw, of obscure origin, may have really originated from the accidental poisoning of tooth pulp by this liquid; and the possibility of this source of disease should be borne in mind."—(*Lancet.*)

On the Subcutaneous Method of Treating Wounds. By M. GUÉRIN.—"M. Jules Guérin, the veteran author of the 'subcutaneous method,' not satisfied that his views have even yet become thoroughly comprehended, constantly reiterated though they have been, read last week a paper at the Academy of Medicine, in which he summarily restated them, and which he introduced in the following terms:

"'During the now well-nigh thirty years that I have made known the fundamental difference presented by the cicatrization of wounds under the skin and exposed to the air, I have had frequent occasion to convince myself that this difference is not always sufficiently appreciated, and that the expressions which I propose to characterize it have not always been accepted in the sense and extent which I assigned to them. Quite recently, on the occasion of my laying a communication before the Academy on the 'Treatment of Exposed Wounds by Pneumatic Occlusion,' I met with, on the part of one of the most able of my colleagues (M. Velpeau), a renewed manifestation of that difference of opinion, which dates on his part as far back as the original exposition of my ideas on the immediate organization of subcutaneous wounds. Such diversity would justify this new development of so important a question in pathological physiology, were I not likewise led to it by the necessity of specifying in

a more complete manner the order of the phenomena which constitute the scientific basis of the new surgical method which I have recently proposed. (*Medical Times and Gazette*, February 17, p. 180.)

"'I now am about to recapitulate in a definite manner the facts and considerations which are fitted to establish—1. That the physiological process which I have designated by the term *immediate organization* of subcutaneous wounds is a process essentially different from the process of cicatrization of wounds when exposed to the air. 2. That this process, wrongly considered as the product of *adhesive inflammation*, or of the *agglutination* of surfaces brought into contact, is, from its initial phenomenon until its last stage, the analogue of the primary formative process of organs. 3. That the immediate organization of wounds subtracted from contact with the air is really the result of the absence of such contact, just as the suppurative process of inflammation, which inevitably precedes the cicatrization of exposed wounds, is truly the effect and result of contact with the air. 4. Finally, the methods which are privileged to induce the immediate organization of wounds owe this to the property which they have of preserving the wounds from contact with the air; and that consequently their essential character, their originality, and their efficacy are derived far less from the material dispositions of the operative procedures than from the complete knowledge of the principle which constitutes their basis, and the appropriation of procedures which are well calculated to correspond to this principle and to develop its benefits.

"'Such are the four propositions which appear to me, when suitably developed and confirmed by the various proofs upon which they are based, capable of carrying conviction into every mind as to the fundamental character of the physiological process by which wounds are cicatrized when sheltered from contact with the air, and the originality of the methods which have given rise to this result.'"—(*Med. Times and Gaz.*)

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Fissured Palate and Upper Lip.—"At the meeting of the Royal Medical and Chirurgical Society, on May 8th, Mr. Moore introduced a young man, aged eighteen, who had been born with a completely fissured palate and upper lip, and with the right nostril open throughout into the mouth. The hare-lip was closed by Mr. Moore when the patient was six weeks old, and in his subsequent growth the separated alveolar ridge had come into contact without actually uniting. The fissure at present therefore began at the level of a line drawn across between the lateral incisor teeth; it widened to the breadth of nearly an inch, and ended by a double uvula. With the view of avoiding an operation, Mr. Moore requested Mr. Turner, Assistant Dental Surgeon to the Middlesex Hospital, to attempt to fill up the gap.

"Mr. Turner exhibited to the Society the obturator which he had constructed. It consisted of a piece of soft or partially cooked India-rubber, adjusted to the free margins of the cleft, and overlapping both their upper and under surfaces; a pendulous portion filled up the space between the halves of the divided uvula, allowing them free action in front of it. The apparatus was fixed to one tooth on either side of the mouth by a metallic bar, which fitted across the palate. Mr. Turner thought this to be the most complete mechanical contrivance yet applied to the correction of deficiencies of the palate, and likely ultimately to supersede the ordinary plastic operation. By its use the trouble and pain of the operation, with

its attendant risks of complications and failures, were avoided; and the natural arch of the palate, which the plastic operation more or less depressed according to the width of the fissure, was preserved. Where, moreover, the paucity of soft tissue round the fissure of the hard palate rendered complete occlusion difficult, if not impossible, the patient might, after all, be compelled to use an artificial palate. This obturator was the invention of Dr. Kingsley, an American dentist, by whom it was introduced into this country."—(*Ibid.*)

"*Salivary Calculus of Unusual Size.*—Mr. Bruce lately exhibited to the London Pathological Society a specimen which had been presented to the Museum of University College by Mr. Price. It weighed eleven grains and a half, and measured three-quarters of an inch by a quarter. It was regularly fusiform, but nodulated. It appeared to consist of animal matter, phosphate of lime, magnesia, a small amount of sulphate—but this, Mr. Bruce remarked, was unusual—no carbonate."—(*Ibid.*)

"*On Fossil Teeth.* By Mr. Ibbetson.—In the paper upon fossil teeth of fishes in the Palæozoic and lower members of the Mesozoic rocks, read before the Odontological Society by Mr. Ibbetson, a few preliminary remarks were made upon the faithful history of the animal kingdom furnished hy fossil teeth generally; and in examining the fauna of the different rocks, the advantage of commencing with the most ancient and taking them in their order of stratigraphical superposition rather than proceeding from the most recent to the earlier beds, was clearly stated. Adopting this method, the leading species, genera, and families of the class fishes were noticed according to the order of their succession in *time*, not in *rank*, as they appeared in the various formations from the Silurian beds to the Lias. Of the 8000 or more known species of fishes, about 1000 belong to the Ganoid and Placoid orders, and to which those found below the Lias are limited, no instance of any of the 7000 or more species of either the Ctenoid or Cycloid orders being known below the Oolitic series. The existence of fishes was formerly believed to date from the Bala beds of the Cambrian rocks, but what were supposed to be the defensive spines of the Onchus Murchisonii have since been proved to be the caudal appendages of a Crustacean. The earliest known evidence of their existence is furnished by fragments of jaws with teeth found in the Ludlow group of the upper Silurian deposits. The affinities of these fragmentary remains have not been clearly determined. Agassiz refers them with a doubt to the genera Plectrodus and Sclerodus of his Placoid order. Murchison, in the last edition of his Siluria—on the authority of Sir Philip Egerton—supposes them to belong to a small species of Ganoid fish; while Mr. J. W. Salter suggests that they may have belonged to Pteraspis or Cephalapsis, the teeth of these genera—even if they possessed such organs—being yet unknown. The earliest evidence of the existence of the class whose affinities can be defined, is furnished by the teeth of several genera of fishes in the Devonian rocks, in which occur Ctenoptychius and Ctenodus genera of the family of Cestracionts, and belonging to the order Plagiostomi. The various species of the different genera of Cestracionts were enumerated as they respectively occur in the successive rocks from the Devonian to the Lias. Acrodus was referred to as possessing special interest, from the faithful interpretation which is afforded of

the genus by its consanguinity with the Cestracian Phillippi of the Australian seas, the sole existing representative of this family of fishes, so rich in genera and species in the Palæozoic and Mesozoic ages. The species and genera of the Hybodontidæ were next noticed. In entering upon the order Ganoidei, Pteraspis and Cephalaspis were referred to as existing in beds of earlier date than those in which Plectrodus and Sclerodus are found; therefore in the event of the suggestion of Mr. J. W. Salter being confirmed, these genera would become the earliest known indication of the class Fishes. The species and genera of the Families Cælacanthi, Dipteridæ, Acanthodei, Sauroidei, Lepidoidei, and Pycnodontei were all referred to as they respectively occur in *time*, and the dental distinctions of the various species and genera were noticed. Occasion was taken to refer to the removal, by Professor Owen, of the genus Placodus—found in the Muschelkalk—from the family Pycnodontei, and by Professor Huxley, of the genus Stagonolepsis—found in the Devonian rocks—from the family Dipteridæ, of the class Fishes, to the class Reptiles, and the dental characters and other correlations of structure upon which the amended classifications were established, were pointed out. The paper was illustrated by a valuable collection of fossils, and a number of beautifully executed diagrams."—(*Ibid.*)

"*Iodized Cotton.*—Dr. Robert Greenhalgh gives (*Lancet*, May 26) the following as the mode of preparing this article: Two ounces of iodide of potassium and one ounce of iodine are dissolved in eight ounces of glycerin, in which solution eight ounces of cotton wool are thoroughly saturated and then carefully dried. * * * Dr. G. states that the cases in which he has found this application most useful are, subinvolution with or without congestion or induration of tissue. * * * It possesses the following advantages: It is clean, light, and portable; it produces no irritation; destroys all fetor; is considerably stronger than the compound tincture of iodine, is more readily absorbed, and can be kept in contact with the diseased tissues for a longer period. Moreover, it does not soil linen."—(*Amer. Journ. of Med. Sci.*)

"*Mineral Ether.*—Under this name a very pure and useful article has been introduced into commerce. It is free from all disagreeable smell, volatilizes perfectly, leaving no odor, and removes grease stains most effectively."—(*Chem. News.*)

"*An Improved Mouth-Piece for Administering Nitrous Oxide Gas.* By Thos. S. Stevens, D.D.S.—In Prof. Carnochan's article on nitrous oxide gas, in a former number of the *Reporter*, he speaks of the want of a proper instrument or mouth-piece for its administration, so that the same material need not be breathed over and over again. This is indeed a most serious objection to the common method of administering it; when the gas is inhaled from the bag into the lungs, and exhaled into the bag again, loaded with carbonic acid and other impurities, a portion of the nitrous oxide being absorbed each time it is inhaled, it is obvious that during the latter part of its administration the contents of the bag must become very impure, and positively injurious to breathe.

"An arrangement that will entirely obviate this difficulty may be easily made by taking a common black rubber mouth-piece, such as is usually used in administering the gas, cutting it in two between the mouth-piece

proper and the stop-cock. From the mouth-piece extend a plain neck or cylinder of silver or brass, about two inches in length, and an inch and a quarter calibre on the top part of this neck. Let there be a hole the same size as the one through the mouth-piece, with a self-acting valve fitting over it. The valve may be made of leather, one edge extended, and fastened down to the cylinder, acting as a hinge; a piece of brass should be fastened on the top to give it sufficient weight, so that it will readily fall down to its place. The stop-cock section it will be necessary to enlarge in diameter, by fitting a collar of wood around it, so that it may be screwed into the end of the cylinder on the mouth-piece. The end should be made plane, and over the opening for the escape of gas, fit a valve similar to the one on top. In the act of inspiration this valve will allow the escape of gas from the bag, while the one on top will remain closed. The force of expiration will shut this valve, and force open the one on top, and allow the breath to escape into the room. My partner, Dr. J. M. Davis, and myself have used such a one in our dental practice for months, and find it much pleasanter to our patients, and more satisfactory to ourselves to give pure gas. I do not suppose it would be so practicable in protracted operations, as it would require a very large bag, and consume more gas; but for teeth extraction, and short surgical operations, very little more gas is required, and not a particle of it breathed over twice."—(*Med. and Surg. Reporter.*)

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"*Surgical Uses of Liquid Glass.*—The *Brit. Med. and Surg. Journal* quotes from *Giornale Veneto* and *Bull. de Thérap.* some remarks on the uses of liquid glass. This is a silicate of potash, which is soluble in hot water, but insoluble in cold. It has been used for rendering structures incombustible, for protecting against moisture, etc., and the late Professor Schuh, of Vienna, employed it in surgery, and made a communication on the subject to the medical society of that city. He first used it in a case of arthritis of the elbow-joint. The solution is applied by means of a brush over the ordinary bandages. The advantages which this application is said to possess are the following: 1. It is simple and easy of application. 2. It dries and hardens rapidly, requiring for this purpose only five or six hours. Desiccation may be favored by using a solution evaporated to the consistence of a syrup. 3. It is very solid and impermeable. 4. It is readily removable by means of hot-water. 5. It is very economical. Before putting on the bandages, a layer of liquid glass may be applied over the limb. At the Venice General Hospital Dr. Minich has used the liquid glass with great advantage, in three cases of coxalgia, in seven cases of fracture, and in three cases of disease of the knee-joint. He has found it to possess superior advantages as regards solidity and durability. Plaster of Paris becomes sooner hardened, but is very heavy in comparison with the silicate of potash."—(*Ibid.*)

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Chloride of Zinc as a Disinfectant.—"As the season of vile odors and foul miasms is opening upon us with a dark cloud of cholera glooming in the horizon, the question of disinfectants assumes more than ordinary interest. We notice in the daily papers a circular from Dr. S. C. Blake, the city physician, recommending the use of chloride of zinc for the purification of basements, vaults, and sick rooms. In this he agrees with the distinguished chemist, Prof. Blaney, of Rush Medical College, who,

in a recent letter to Mr. E. H. Sargent, the manufacturer, writes as follows: 'There is abundant scientific authority—with which my own experience accords—to prove beyond doubt the immense value of this agent as a deodorizer, and, in a high degree, as a disinfectant. While it is equally as prompt and efficient as chloride of lime, the best known and the longest used of the deodorizers, it has over it the great advantage that it has no offensive odor of its own, when neutral, and may be freely used about the persons and clothing of the most sensitive persons without exciting any feeling of disgust. As a deodorizer, for use in closed apartments, and within dwellings for general family use, I am of the opinion that the chloride of zinc is the most SAFE, the most PROMPT, and the most EFFICIENT of the deodorizers now furnished for general distribution.'"—(*Chicago Medical Journal.*)

"*Ready and Simple Purification of Water.*—MR. THOMAS SPENCER has discovered that the black oxide of iron frees water from nearly all its organic impurities. He was led to this discovery by studying the natural purification of water during its percolation of the soil. He found that sands which contained the black or magnetic oxide of iron purified the water which was filtered through them, and that sands which did not contain this substance had no appreciable effect.

"Magnetic or black oxide of iron as obtained for medicinal purposes is unsuited for use, not only on pecuniary grounds, but because of its finely-divided state. By heating native carbonate of iron, or spathose iron ore, magnetic oxide is obtained in a suitable condition, but not cheaply enough for application on the large scale. Mr. Spencer obtains it by heating together hæmatite, or red oxide of iron ore, with sawdust. The oxide, as made by his process, contains a small percentage of carbon. The use of this carbon is, he states, to render the substance harder and less brittle.

"In the state in which it is used it is in the form of coarse black grains, which are strongly attracted by a magnet. Its commercial name is 'magnetic carbide.'

"Now, if ordinary river water, even the more impure kinds of it, are made to percolate a layer of magnetic carbide some inches thick, it is not only filtered, as it would be by passing through a similar layer of gravel or sand, but *it is deprived of much of its soluble organic impurities.* According to Mr. Spencer, water containing several grains of organic matter, by filtering through a sufficient layer of magnetic carbide loses nearly the whole of it, containing, after its filtration, only about half a grain or less of organic matter. The effects of passing the water supplied by the London companies through a domestic filter containing a layer of this substance is certainly very striking. In a few minutes the water passes through the filter, and when compared with some of the water which has not been purified in this way a great difference is observed. Not only is it remarkably bright, but it is found to have lost its previous yellowish color, and to be free from smell or taste of any kind. But more than this, if a few drops of solution of permanganate of potash are added to the water, the pink color thus given to the water will be found to be unchanged, when the water which has not been purified by this process will have wholly destroyed the color of permanganate of potash similarly employed.

"Lastly, the crowning property of the black oxide of iron, or magnetic

carbide of Mr. Spencer, is that it suffers no perceptible diminution in its power by time and use. In the waterworks at Southport, in Lancaster, it has been in use for seven years without showing any diminution in power, and in domestic filters in use for the same period the same is stated to be the case, although the purifiers have not once been cleansed or refitted. With a filter which Mr. Spencer stated had thus been in use the effects upon water were as striking as in one newly fitted.

"Another way in which water may be purified, probably well known to most of our readers, is that of Mr. Condy. The solutions of permanganate of potash and other bases when added to water soon oxidize organic matters, sulphuretted hydrogen, and other oxidizable bodies which may undesirably be present in water. The quantity necessary for the purpose is so exceedingly small that the alkali introduced into the water is of no importance, while the manganese is converted into hydrated peroxide of manganese, which gradually settles down or may be removed by filtration. The permanganate should be added to the water in as large a quantity as the water can deprive of its pink color on standing for two or three hours after it has been added.

"By one of these ways, by using Mr. Spencer's purifying filter or by adding a little of Mr. Condy's solution of a permanganate, and subsequently passing the water through a common filter, those who appreciate the hygienic importance and the luxury of pure drinking water can easily supply themselves with it, albeit the water may have to come from the Thames or other stream similarly polluted."—(*Med. Times and Gaz.* and *Am. Journ. Med. Sci.*)

Solubility of Gold in Alkaline Sulphides.—Prof. Alfred Bird writes to the *Chem. News*, that on looking into an old work on chemistry by "Macquer," published more than a century ago, he met with the following on this subject: "To Dissolve Gold by Liver of Sulphur.—Mix together equal parts of common brimstone and a very strong alkali—for instance, nitre fixed by charcoal. Put them in a crucible and melt the mixture, stirring it from time to time with a small rod.

"There is no occasion to make the fire very brisk, because the sulphur facilitates the fusion of the fixed alkali. Some sulphurous vapors will rise from the crucible, the two substances will mix intimately together, and form a reddish compound.

"Then throw into the crucible some little pieces of gold, beat into thin plates, so that the whole do not exceed in weight one-third part of the liver of sulphur. Raise the fire a little. As soon as the liver of sulphur is perfectly melted, it will begin to dissolve the gold with ebullition, and will even emit some flashes of fire.

"In the space of a few minutes the gold will be entirely dissolved—especially if it was cut and flattened into small thin leaves.

"The process here delivered is taken from M. Stahl. The design of that ingenious chemist's inquiry was to discover *how Moses could burn the golden calf*, which the Israelites had set up and worshiped, while he was on the Mount; how he could afterward *reduce the calf to powder*, throw it into the water which the people used, and make all who had apostatized drink thereof, as related in the Book of Exodus.

"'M. Stahl,' having first observed that gold is absolutely unalterable and indestructible by the force of fire alone, be it ever so violent, concludes that without a miracle Moses could not perform the above-men-

tioned operations on the golden calf, any way but my mixing some matter qualified to dissolve it. He then takes notice that pure sulphur does not act upon gold at all, and that many other substances which are thought capable of dividing or dissolving it, cannot, however, do it so completely as is necessary to render that metal susceptible of the effects related. He then gives the method of dissolving it by liver of sulphur, described in the process.

"Liver of sulphur dissolves likewise all other metals, but 'M. Stahl' observes that it attenuates gold more than any other metallic substance, and unites much more intimately than with the rest. This appears from what happens on attempting to dissolve in water any of the mixtures resulting from the union of another metal with the liver of sulphur, for then the metal separates, and appears in the form of a powder or a fine calx; whereas when gold is united with the liver of sulphur the whole compound dissolves in water so perfectly that *the gold even passes with the liver of sulphur through the pores of filtering paper*. If an acid be poured into a solution of this combination of gold and liver of sulphur, the acid unites with the alkali of the 'hepar,' and the gold falls to the bottom of the liquor along with the sulphur, which doth not quit it. The sulphur thus precipitated with the gold is easily carried off by a slight torrefaction, after which the gold remains exceedingly comminuted.

"The sulphur of this compound may also be destroyed by torrefaction without the trouble of a previous solution and precipitation, and then also the gold remains so attenuated as to be miscible with liquors, and floats on them, or swims in them in such a manner that it may easily be swallowed with them in drinking.

"From all this, 'M. Stahl' concludes there is great reason to believe it was by means of the liver of sulphur that Moses divided and in a manner '*calcined*' the golden calf, so that he could mingle it water and make the Israelites drink it."

Factitious Gold.—In reply to a correspondent, the *Journal of Applied Chemistry* says "there is no metal that chemically can be mistaken for gold. All imitations will oxidize when in contact with air. Gold is the only metal utilized that does not show oxidation to some extent. The articles you refer to are made from a combination of base metals, and chemically colored. The deep yellow bears a strong resemblance to *pure* gold, but not to the gold of commerce, or to the gold of any coin issued by any country on the globe. The metallic substance of which those articles were manufactured is called by the trade 'oreide.' Pure gold is 24 carats fine, equal to \$19.20 per ounce. No coin is issued of this fineness. 22 carats is the extent of purity, showing an alloy of about $8\frac{1}{6}$ per cent. Gold has a peculiar weight, which an expert could not be deceived in. The difference between the weight of a bit of gold the size of a pin head, and that of brass, copper, iron, or any other metal, save lead and platina, can be detected instantly, after a little practice in throwing them up a few inches from your hand, and letting them fall into the palm. The gold is at once distinguished by the peculiar *plump* with which it strikes the hand."

"*A Cheap Furnace for Chemical Experiments.*—A correspondent, who is an amateur chemist, sends a drawing and description of a cheap furnace, which he says he has used successfully for two years. He takes a piece of eight-inch stove funnel, twelve or fourteen inches high, and fur-

nished with a cap at the top, which can be removed at pleasure. At the bottom a small hole is cut in the side to receive the pipe from the blower, and the whole funnel is lined inside with pipe clay mixed with sand.

"Three inches from the bottom the lining is increased in thickness and receives some bits of wire, which form a grate. The blower is eight inches diameter and three wide, having four fans made of sheet iron, tin, or even pasteboard, as is also its case, and is driven by a small pulley belting from a larger one designed to be turned by hand. The whole arrangement can be secured to a board, that portion under the furnace being protected by sheet iron.

"In such a furnace our correspondent says he has melted cast iron and manganese in a few minutes. He prefers coke to coal, as giving a more intense heat. His suggestions appear to be valuable to amateurs who do not wish to incur the expense of a complete apparatus."—(*Sci. Amer.*)

"*Economical Sieves.*—Dr. John Parsons, of Mount Pleasant, Kan., writes to us:

"'For sifting dry powders, sieves may be made of stiff paper punched with needle holes, the size of the needle making the sieve fine or coarse. The sieve may be made of any size required, and secured in a drum, as is the ordinary wire sieve; they are easily cleaned, cheap, and may be found useful by some practitioners.'"—(*Med. News.*)

To clean Gold.—The *Scientific American* states that "a gold ring that has lost color may be renewed, according to the 'Practical Metal Worker,' by the following process: Make a paste with 3 parts nitrate potash, 1½ alum, 1½ sulphate zinc, 1½ common salt, put this on the ring, and set the latter on an iron plate over a fire until black hot, then plunge the ring into the cold water. After this it must be polished, which is easily done, with rouge or common chalk, on a woolen cloth. This gives a fine, deep color."

"*Fine Polishing Powder.*—Prof. Vogel, of England, states that the finest powder for polishing optical glasses and fine metals, is made by calcining the oxalate of iron. It is superior to the common polishing powder for glass made of lixiviated colcochar."—(*Ibid.*)

Tin Foil destroyed by Maggots.—A correspondent sends the following note to the *Chemist and Druggist*, with a sheet of stout tin foil curiously perforated:

"Some time ago I rolled a quantity of tin foil on a wooden cylinder. On examining it a few days ago, I found that a number of maggots had issued from the wood, and after boring their way through the numerous folds of foil and the paper in which it was wrapped, had disappeared (probably to assume the *imago* state). I cut into the wood, and succeeded in disinterring a couple of the worms—small white maggots, about three-sixteenths of an inch in length. Every sheet of the foil was riddled."

"*A Test for Carbolic Acid*, by which its usual adulteration with oil of tar may be readily recognized, is furnished in the solubility of the former in 25 to 70 parts of water, or in 2 parts of caustic soda solution. Oil of tar is nearly insoluble in both."—(*Franklin Institute Journal.*)

THE

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ORIGINAL COMMUNICATIONS.

RUBBER vs. WAX.

BY JNO. C. K. CROOKS, M.D., BIRMINGHAM, MICHIGAN.

In the April number of the Dental Cosmos, Dr. Bausman, of Minneapolis, advances certain notions, concerning the use of rubber, which I cannot but consider erroneous. That which I refer to more particularly is the non-injurious effects of wax upon the texture of rubber when vulcanized. I suppose that it is generally understood that, at a moderately high temperature, gum caoutchouc will unite, in a greater or less proportion, with the oils, fatty substances, wax, etc. Now the question of difference is, *Will the rubber become injured by such a union?* If it suffers no injury, then of course, so far as the use of it for dental purposes is concerned, it is of no consequence whether the casts are charged with wax or not; but if the character of the rubber becomes deteriorated—loses its strength and tenacity—it is a question of great consequence, certainly so far as involves the reputation of rubber work, and if established as a principle, so far as involves our own reputation for honesty and uprightness in our business transactions. Having always used wax instead of gutta-percha for trial plates, I have had considerable experience in the matter. In my earlier operations I was extremely careful to remove every particle of wax, as I was taught that the rubber was materially injured by it when left remaining about the teeth and casts. But after a time—when I had gained a little confidence in the manipulation of rubber—I began to think that many of the precautions usually adopted by me were not necessary to uniformly good results, so that when hurried a little in my operations, I did not exercise my former care in removing the wax about the pins, teeth, casts, etc. At first I could discover no difference in my results from this carelessness; but in due time I noticed that some of my plates could be more easily smoothed off and polished than others; that when I cut the rubber plate, particularly about the

teeth and pins where there had been most wax remaining, it could be done very easily even with a dull instrument, and left a polished surface behind, as after cutting wax, and when I removed the teeth from such plates, a moderate warming would be sufficient—*the plate becoming pliable at a low temperature*—and when the teeth were forced away, instead of the rubber (as it should do when good) remaining intact, yielding to the pins and then returning to its position, from its tenacity and elasticity (at most breaking but little), it would tear away in large pieces—sometimes extending through the plate—indicating an almost perfect destruction of the valuable properties of vulcanized rubber—*a rottenness* which had been induced by some cause; and this cause I ascertained beyond a doubt, from further observation and experiment, to be the presence of wax.

Were we to *reason* upon the subject *without* experiment, taking facts as they present themselves, we could not but come to the same conclusion. If we incorporate two substances together of similar chemical composition, *mechanically* (and such is the union between the wax and rubber), the compound will partake of the properties of both, and the predominating character will be of that substance which is in excess. If the wax thus united with the rubber is in a very small quantity, the difference in the rubber will not be perceptible; but if it is considerable, the color of the rubber will be changed to a darker hue, and it will possess those other peculiarities already mentioned, and which are precisely what we might have expected if we had reflected upon the subject previous to experimenting—considering the union mechanical and not chemical. It is so with rubber and wax; it is so with every substance mechanically united with another. Take the old and once familiar example of uniting lard and tallow in the manufacture of candles, or of resin and oil—resin, wax, and oil, in the composition of many of the ointments, and we see the idea sufficiently illustrated. And it is this *mechanical* union which begets all the trouble of which complaint is made. If we had a *chemical* union, then we would have a chemical change more or less marked—a change which would disclose properties new and unique, and easily distinguished from the substances entering into the composition. Reasoning from analogy, then—comparing facts identical with each other—examining the laws which control the union of certain bodies, we are led to the same conclusion to which experiment unerringly leads us, *that rubber and wax, at proper temperatures, will unite mechanically with each other, and that the compound will partake of the properties of both.**

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* It may perhaps be asked, Why do we not have an utter destruction of the properties of rubber, when the packing is done while the wax is frying around the teeth? Because the plaster absorbs the greater portion before the temperature is

Again: I beg to dissent from any and every method of working rubber, which will facilitate the introduction of that substance into the joints of the teeth. This condition of things will occur sufficiently often without taking any especial pains to obtain such a result. To "want the space filled with rubber and nothing else" is to labor for effects, which are the farthest in the world from an imitation of nature, which I consider should be the first aim of every member of the profession in the construction of dental substitutes. It is true that it is quite a desirable thing to "have no space under or between the teeth," yet, in the little expedients adopted for the purpose of keeping out the rubber, how great are the "cess-pools" in comparison with those in and about the teeth in the use of metallic bases! They are but drops in the ocean, while the dark lines running between the teeth, occasioned by the presence of rubber, destroy the whole beauty and exactness of our work, and they become as the "plague spots" in a Grecian painting, or a "daub" upon the face of an otherwise exquisitely finished portrait—they publish, in characters which speak louder than words, that all of our efforts to copy nature have been but miserable failures. All efforts, then, to exclude the rubber from the joints of the teeth are, in my humble opinion, highly commendable. No matter what may be used, in the ingenuity of man, to work out this desirable end, it is exceedingly praiseworthy. A bad and improper expedient will not be persisted in; and the few good ones, which have been or may be suggested, while they may not be uniformly successful, are steps in the right direction, and are infinitely superior to the condition for which they are offered as a remedy. Perfection, *if within our power*, is that for which we should struggle; and when we become satisfied with anything less than this, we come down from our high position—pledged to improvement, and the highest development of Science and Art.

In this place it was my intention to describe a method by which the rubber can be effectually excluded from the joints of the teeth; but as I have already occupied too much space, I will close by simply saying *that perfect joints*—well set and well hardened plaster in the flasks—judicious and careful packing—not using too much force*—will generally obviate all of the unsightly appearances and unpleasant consequences which ruffle the temper and disturb the peace of that member of our profession who expects perfect results without labor, without patience, and without pains.

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raised to the point of union, and for other reasons, such as the change of the rubber by the presence of sulphur, etc.

* The remarks of Dr. Chandler, of Boston, in the December number of the DENTAL COSMOS, are directly to the point, and are deserving of the highest consideration.

CAUSE AND TREATMENT OF DENTAL CARIES.

BY G. A. MILLS, BROOKLYN, N. Y.

The prime causes of dental caries can be classified into two distinct groups, viz., predisposing and exciting. Thus we meet with teeth that are so susceptible to the ravages of decay, that it is almost hoping against hope to endeavor to preserve them from entire destruction. With the young we meet them in a very imperfect state of development, caused in many cases by a want of those elements which are essential for perfection of structure in teeth. Take, for instance, a six-year molar, as we often see it, just emerging from the gum; the enamel of the tooth in a fair state of development, but with deep fissures running across the grinding surface, dividing the tooth, as it *were*, in quarters. Through these crevices the dentine is reached by destructive agents, and eventually the tooth is lost if not brought to the attention of the dentist at an early period. But a day since I saw a case where the second (inferior) molars were but partially emerged from the gum, having in two-thirds the length of the crowns a deep fissure, with a good deal of softening of the dentine; the enamel was well formed up to these lines. No other treatment in this case would do but to remove the softened dentine, and fill with a proper material. Could the human family be brought into a strict observance of hygienic laws we should see less of these defects which we are daily brought into contact with. Not finding the *normal* condition we are compelled to accept the *abnormal.*

Much is said in our societies about dealing with the *unseen*, and that our mission is only to the *seen*. Our highest duty is to be able to prevent. "Prevention is far better than cure." In this direction is opened a large field of usefulness, and we can do *much*, as a profession, to attain *toward* if we do not attain to it. I am convinced that most of the constitutional defects in the teeth are induced in early life by a wicked neglect (*oftentimes*) of the *parent* properly to care for the *diet* of the *child.* To live it must receive nourishment, and nature will only accept to herself such elements as should be assimilated. To be sure, the stomach does not always reject innutritious articles; but if such things are introduced into the system they will not harmonize, and the organism is called from its proper duties, and its strength is wasted in removing that which does not belong to the household. The organs of digestion in many children are almost from their birth overtaxed at the expense of the whole system. It is true that this great *sin* is committed under the mistaken idea of *love to the child.* Why this state of things? Simply for want of education in many cases, and in others, want of reason and self-denial. If we can do anything to remedy this *great evil* by educating the world in this direction, we should not hesitate to do so, for it is very evident to me that here lies a direct line of duty. I am pleased to refer all to the

very interesting, and, I believe, truthful articles in the November and December numbers of the DENTAL COSMOS, "On the Food and the Teeth, and Observations on the Inorganic Constituents of the Food of Children as connected with the Decay of the Teeth, etc." I think had I written the remarks relative to the decay of teeth I would have said much of the *direct* cause of dental caries. Every one will agree that irregularities of teeth have much to do in favoring caries. Teeth with an imperfect articulation cannot perform the important duty of relieving each other of food, etc. that may have lodged upon them, and there is an inability on the part of the patient to remove these substances thoroughly with the tooth-brush or tooth-pick.

The treatment of dental caries is various. In this, something more is wanted than the mechanical ability to prepare the cavity and introduce the filling. Were the teeth unprovided with vitality, we should not need to understand broad underlying principles, but as portions of a living organism they demand an observance of the same general laws which govern treatment of diseased conditions in other portions of the economy, and a recognition of the fact that a plan of treatment which would be salvation to one tooth and insure comfort to it, would be destructive to another. It is not always safe to trust the file, excavator, bur, or burnisher for superficial caries, nor always to expect the same happy results with *gold*. I believe it is always safe to introduce either a conducting or a non-conducting substance as far as the comfort of the tooth would be concerned; but it is not always best to introduce a *gold* filling, immediately after the decay has been removed, especially in teeth of a low organization, and in a person of a high nervous temperament. I have found in such cases that a non-conducting filling is productive of better results, and letting it remain for a few days or weeks will make the condition of the tooth more favorable for the reception of a *gold* filling, *which*, had it been introduced at first, would have been the cause of much annoyance and suffering.

I see no direct line of treatment to propose for us to follow. We should become as eclectic as possible, and certainly do all in our power to make our operations successful.

EXPANSION OF PLASTER.

BY J. S. SCOTT, COBOURG, C. W.

AN article upon the above subject, in the June number of the DENTAL COSMOS, by Dr. T. D. Chamberlin, supplies the members of the profession with several ideas I had intended to communicate. Having been convinced for some time that much of the expansion of plaster can be prevented by manipulating it before it becomes entirely dry, I have experimented with a view of testing the correctness of the idea. The results thus far have been more satisfactory than I had anticipated. For a whole

or a partial upper set, take the impression in wax; then, while it is soft, cover the surface with indentations, say a quarter of an inch deep, and raise the impression a trifle at the back edge to prevent the plaster from passing out in that direction; place it in cold water to harden; then mix the plaster by placing it in water, to which has been previously added a small quantity of sulphate of potash; have the batter at first quite thin; beat it thoroughly until the substance adheres to the sides of the vessel; then take the impression quickly, using just plaster enough to cover the surface of the impression; remove and varnish with *thin varnish;* oil and fill; as soon as the plaster sets, place the model in warm water to soften the wax. The thin coating of plaster will be easily removed from the model. Articulate and set up the teeth at once. If you have occasion to leave the work for a time, place the models under water so as to keep the plaster *thoroughly saturated with water throughout the whole operation.*

There is the same difficulty to be overcome with regard to expansion, in manipulating the moulds. Have your flask wet; as soon as your model is properly placed in the flask, insert at once in boiling water; then proceed as directed in the July number of the DENTAL COSMOS, page 646, for removing the wax and boiling down.

The above process will be found rather unpleasant, but the result, I fancy, will recompense any person for his extra trouble. The idea has occurred to me as to whether the sulphate of potash does not prevent expansion solely by retaining the moisture. The inside of the model certainly remains moist long after the surface is quite dry.

PROCEEDINGS OF DENTAL SOCIETIES.

TRANSACTIONS OF THE AMERICAN DENTAL ASSOCIATION, AT ITS SIXTH ANNUAL SESSION.

BY DR. W. C. HORNE, NEW YORK.

OFFICERS.

President.—Dr. C. W. Spalding, St. Louis, Missouri.

1*st Vice-President.*—Dr. G. H. Cushing, Chicago, Illinois.

2*d Vice-President.*—Dr. James McManus, Hartford, Connecticut.

Corresponding Secretary.—Dr. L. D. Shepard, Salem, Massachusetts.

Recording Secretary.—Dr. J. Taft, Cincinnati, Ohio.

Treasurer.—Dr. I. J. Wetherbee, Boston, Massachusetts.

COMMITTEES.

Committee of Arrangements.—Drs. B. S. Codman, Boston; L. D. Shepard, Salem; A. Lawrence, Lowell.

Committee on Publication.—Drs. J. H. McQuillen, Philadelphia; W. C. Horne, New York; C. P. Fitch, New York.

Committee on Prize Essays.—Drs. Isaiah Forbes, St. Louis; Geo. L. Paine, Xenia; I. J. Wetherbee, Boston; T. L. Buckingham, Philadelphia; A. S. Talbot, Lexington, Ky.

Committee on Dental Physiology.—Drs. H. S. Chase, Iowa City; Julius Chesebrough, Toledo; W. H. Morgan, Nashville.

Committee on Dental Chemistry.—Drs. E. Wildman, Philadelphia; H. A. Smith, Cincinnati; T. L. Buckingham, Philadelphia.

Committee on Dental Pathology and Surgery.—Drs. C. W. Spalding, St. Louis; W. H. Atkinson, New York; A. Lawrence, Lowell; C. R. Butler, Cleveland; W. Taft, Cincinnati.

Committee on Operative Dentistry.—Drs. J. A. Kennicott, Chicago; Jas. McManus, Hartford; W. H. Allen, New York.

Committee on Mechanical Dentistry.—Drs. Joseph Richardson, Terre Haute; B. T. Whitney, Buffalo; Geo. L. Field, Detroit; J. A. Perkins, Albany; E. Strong, New Haven.

Committee on Dental Education.—Drs. D. W. Perkins, Milwaukee; Geo. A. Mills, Brooklyn; L. D. Shepard, Salem.

Committee on Dental Literature.—Drs. A. Hill, Norwalk; A. Berry, Cincinnati; F. Y. Clark, Savannah.

Committee on Voluntary Essays.—Drs. Geo. Watt, Xenia; J. W. Ellis, Chicago; W. O. Kulp, Muscatine.

Special Committee on Dentifrices and Washes.—Drs. J. McManus, Hartford; Geo. Watt, Xenia; T. L. Buckingham, Philadelphia; J. Chesebrough, Toledo; H. S. Chase, Iowa City.

The Committee of Arrangements having obtained from the Legislature of the State of Massachusetts the use of the Hall of Representatives in the State House, at Boston, for the Sixth Annual Session of the American Dental Association, the President, Dr. C. W. Spalding, of St. Louis, called the assembly to order at 11 A.M. of Tuesday, July 31, 1866.

Prayer was offered by Dr A. A. Cook, of Milford, Connecticut.

Dr. N. C. Keep, of Boston, delivered the following welcoming address:

Mr. President, and Gentlemen of the American Dental Association:—The very pleasant duty of presenting the welcome of the Massachusetts Dental Society and the dentists of New England to you has been assigned to me. I recognize in each of you, gentlemen, a delegate of some society, bringing with you the fruits of the research and observations of the society which you represent, and commissioned to carry back from this meeting the results which may be eliminated from examinations of specimens, clinics, and discussions by this Association. Gentlemen, the meeting of such numbers of our profession to consult for the advancement of rational and scientific principles, and thereby to promote the usefulness and respectability of our specialty is of recent date. These meetings, if judiciously conducted, must exert sanitary and scientific in-

fluences of the highest moment. To accomplish this most desirable object, let each resolve to seek earnestly for the truth.

I welcome you to the Commonwealth of Massachusetts; her jewels are her children. For half a century at least the accumulation of wealth, so often the object of effort and desire by the world at large, has been raised above the mere love of accumulation by an enlarged benevolence. As illustrations of what I mean, I might cite the examples of McLean, Lawrence, Appleton, and the great prince of givers, Hon. George Peabody, whose benefactions to society are like copious showers, when the humblest plant and the ornamental shrub are stimulated to new life, usefulness, and beauty. Names like these, sons of Massachusetts, who have been benefactors of mankind, are sure to be remembered with honor and complacency by us, fellow-laborers in diminishing human suffering. By the remedial powers of our art, we are enabled to do much to relieve distress and improve the condition of the unfortunate.

In seeing our institutions, to which we welcome you, you will find the great New England idea that they are to promote the education, comfort, and happiness of all classes of society in the main carried out. Provision is made for educating all classes of persons, and every profession except dentists. But we hope ere long to have a dental college, museum, and library, which are urgently needed. I welcome you to the City of Boston, to Fanueil Hall, to Bunker Hill, to Harvard University, to our State and City Hospitals, to our City Library, to the collections of the Boston Society of Natural History, to the Warren Museum, where the most perfect skeleton of the mastodon is preserved, to the Institute of Technology, to the cabinets of the Medical College, to our harbor and its islands, and last, but not least, to our hearts and hospitalities.

The report of the Committee of Arrangements on credentials was presented, the names of the delegates present read, and the report was accepted. It was as follows:

Association of Clinical Lecturers of the New York College of Dentistry.—Drs. Ehrick Parmly, W. B. Roberts.

Brooklyn Dental Association.—Drs. W. Jarvie, R. M. Streeter, A. Y. Paddock, J. B. Young, A. C. Hawes.

Central Massachusetts Dental Association.—Drs. S. P. Miller, J. McGregory, T. D. Chamberlain, O. C. White, C. W. Estabrook, G. L. Cooke, W. W. Snow.

Central New York Dental Association.—Dr. S. B. Palmer.

Central States Dental Association.—Drs. I. L. Nourse, B. F. Arrington, W. H. Goddard.

Chicago Dental Society.—Drs. J. W. Ellis, G. H. Cushing, J. A. Kennicott.

Cincinnati College Dental Association.—Dr. H. R. Smith.

Connecticut State Dental Association.—Drs. F. T. Mercer, J. A.

Pelton, E. Strong, R. W. Browne, J. M. Riggs, E. E. Crofoot, Wm. Allender, John Colby, S. L. Geer.

Connecticut Valley Dental Association.—Drs. Joseph Beals, A. F. Davenport, G. Bowers, E. V. N. Harwood, F. Searle, A. B. Cowan, I. F. Adams, S. G. Henry, A. A. Howland, C. S. Hurlburt, S. P. Martin, O. R. Post.

Hudson Valley Dental Association.—Drs. C. H. Jenkins, A. H. Taylor, E. J. Young.

Illinois State Dental Association.—Drs. O. Wilson, L. P. Haskell, M. S. Dean, E. Honsinger.

Indiana Dental Association.—Drs. W. F. Morrill, J. H. Jameson.

Lebanon Valley Dental Association.—Drs. S. H. Guilford, J. Fleming.

Massachusetts Dental Association.—Drs. A. A. Cook, O. F. Harris, E. G. Leach, T. B. Hitchcock, E. N. Harris, J. H. Batchelder, N. C. Keep, W. L. Bowdoin, S. J. McDougal, G. T. Moffatt, J. M. Daly, E. C. Rolfe.

Merrimack Valley Dental Association.—Drs. G. W. Lawrence, Chester Heath, J. Fisk, D. T. Porter, A. T. Johnson, J. H. Kidder, D. K. Bentelle, L. F. Locke.

Michigan Dental Association.—Drs. J. A. Harris, G. L. Field, J. H. Warner, J. A. Robinson.

Nashville Dental Association.—Dr. W. H. Morgan.

Newark Dental Society.—Drs. G. F. J. Colburn, W. G. Lord.

New Haven Dental Society.—Dr. H. J. Stevens.

New Orleans Dental Society.—Dr. J. S. Knapp.

New York College of Dental Surgeons.—Dr. J. Smith Dodge, Jr.

New York Society of Dental Surgeons.—Drs. I. W. Lyon, C. E. Latimer, J. C. Robbins, J. W. Cosad, Frank Abbott, N. W. Kingsley, A. L. Northrop, J. A. Bishop, W. A. Bronson, Geo. E. Hawes.

Odontographic Society of Pennsylvania.—Drs. J. L. Suesserott, A. B. Robbins.

Ohio College Dental Association.—Dr. W. W. Allport.

Ohio State Dental Association.—Drs. C. M. Kelsey, B. F. Spellman, W. P. Horton, C. R. Butler.

Pennsylvania Dental Association.—Drs. J. C. Green, A. Wert, Spencer Roberts, J. H. Githins, J. J. Griffith, G. T. Barker.

Pennsylvania Dental College.—Dr. T. L. Buckingham.

Philadelphia Dental College.—Dr. J. H. McQuillen.

Southwestern New York Dental Association.—Drs. F. M. Briggs, J. C. Gifford.

St. Louis Dental Association.—Dr. H. J. McKellops.

Stratford County Dental Association.—Dr. C. M. Murphy.

Susquehanna Dental Association.—Dr. J. D. Wingate.

Western Dental Society.—Dr. Aaron Blake.

Western New York Dental Society.—Drs. A. P. Southwick, Thos. G. Lewis.

On the motion to adopt, Dr. Atkinson raised the question, whether delegates could be admitted who did not represent any local society. The Chair decided in the negative. Dr. Atkinson then called for the credentials of the delegates announced from the Association of Clinical Lecturers of the New York College of Dentistry, as he doubted their regularity.

Dr. L. D. Shepard, from the Committee of Arrangements, stated that the delegates had been admitted, as their credentials satisfied the demands of the Constitution.

Dr. H. J. McKellops, of St. Louis, moved to refer to a committee of three, to examine and decide whether or not the delegates should be admitted, the decision of the committee to be final; which, after some discussion, was carried. The Chair announced Drs. McKellops, Watt, and Horne, as the committee.

Dr. I. Forbes moved the adoption of the Report on Credentials, subject to the decision of the special committee. Carried.

Dr. I. J. Wetherbee offered a resolution, which was unanimously adopted, inviting the physicians and dentists resident in Boston, and also any others who may be in the city during the session of the Association, to be present, and take seats with this body.

The Secretary was then directed to call the roll, and the following permanent members answered to their names, in addition to the delegates reported:

Permanent Members.—Drs. C. P. Fitch, W. H. Atkinson, J. T. Metcalf, F. Y. Clark, C. W. Spalding, I. Forbes, W. H. Allen, C. E. Francis, G. S. Allan, W. C. Parks, G. A. Mills, A. W. Allen, W. C. Horne, F. N. Seabury, G. Watt, C. Palmer, I. J. Wetherbee, H. F. Bishop, B. S. Codman, I. A. Salmon, L. D. Shepard, J. McManus, W. W. Sheffield, W. H. Jones, A. Hill, E. A. Bogue, S. D. French, J. N. Scranton, E. Strong, E. G. Cummings, G. A. Gerry, A. Lawrence, M. S. Dean, O. Wilson, J. C. Gifford.

The reading of the minutes of the last session was by unanimous consent dispensed with; printed copies being in the hands of all the members.

On motion of Dr. Watt, the Nominating Committee, to consist of nine, was nominated to the Association by the Chair. The Committee as confirmed consist of Drs. W. W. Allport, I. Forbes, A. Hill, C. R. Butler, W. H. Atkinson, W. H. Morgan, J. S. Knapp, T. L. Buckingham, A. Lawrence. The Committee retired for consultation.

The Committee of Arrangements made a report on the hours of business, as follows: Clinics daily from 8½ to 10 A.M. Morning Session 10 A.M. to 2½ P.M. Evening Session 7½ to 10 P.M. Which after some discussion was adopted. The Committee further announced as their

programme for the entertainment of members, a performance on the great organ in the Music Hall, on Wednesday, from 12 M. to 1 P.M., and a visit to the Museums of Professor Agassiz and Dr. Warren; and on Thursday a steamboat excursion down Boston Harbor, during the intervals of the sessions.

The Treasurer submitted his annual report showing the receipts for the past year to have been $448, and the expenses $236; leaving a balance in the treasury of $212. Accepted.

On motion of Dr. Gerry, of Lowell, the report was referred to an Auditing Commitee; Drs. Gerry, Cushing, and Field were appointed.

Dr. George Watt offered a resolution for the appointment of a committee to draw up a Code of Ethics for the government of members of this Association; which was adopted, and the following committee appointed: Drs. Watt, McQuillen, and John Allen.

The Auditing Committee reported the Treasurer's accounts correct; which report was adopted.

A recess of twenty minutes was then taken till the Nominating Committee should be ready to report; at the expiration of which time the President called the meeting to order, and the Committee reported the following names:

For *President.*—C. P. Fitch, of New York; A. Lawrence, of Lowell.

For 1*st Vice-President.*—W. H. Morgan, Nashville; J. S. Knapp, New Orleans.

For 2*d Vice-President.*—G. T. Barker, Philadelphia; L. D. Shepard, Salem.

For *Corresponding Secretary.*—A. Hill, Norwalk; M. S. Dean, Chicago.

For *Recording Secretary.*—J. Taft, Cincinnati; W. C. Horne, New York.

For *Treasurer.*—W. W. Sheffield, New London; I. J. Wetherbee, Boston.

The report was accepted, and the Association proceeded to vote by ballot, when the following gentlemen were elected:

President.—C. P. FITCH.

1*st Vice-President.*—W. H. MORGAN.

2*d Vice-President.*—L. D. SHEPARD.

Corresponding Secretary.—A. HILL.

Recording Secretary.—J. TAFT.

Treasurer.—W. W. SHEFFIELD.

The Association then adjourned to 7½ P.M.

FIRST DAY.—*Evening Session.*

The Association was called to order at 7½ P.M. by the President.

The minutes of the morning session were read and approved.

The Special Committee on credentials reported that they found the Association of Clinical Lecturers of the New York College of Dentistry to be fully organized, and consisting of well-known members of the profession; and that Drs. Ehrick Parmly and W. B. Roberts had been regularly appointed delegates therefrom to this Association, and therefore entitled to their seats; which was adopted.

The retiring President, Dr. Spalding, then addressed the Association. After the customary congratulatory remarks, the speaker referred to the necessity and practicability of establishing more and better dental schools. On this point he said:

I doubt the utility of attaching a dental chair or chairs to schools of medicine, for the purpose of graduating students to practice dentistry. In my estimation such chairs are much needed in medical schools, but are useful only as a means of rendering the qualifications of the medical student more complete and comprehensive. Impressed as I am with the conviction that no subject of greater importance to the future well-being of our profession can engage the attention of this body, I take this occasion to bring the subject to your notice, and to propound to you the question whether we do not need a better, as well as a more extensive, system of dental education. To that question I think there can be but one response. The want is too perceptible to require either an argument or even an examination to prove its existence. The next question to be considered is whether the thing is practicable. Can it be done? Have we the means for its accomplishment within ourselves? And if this question is affirmatively answered, the final one is how can it be best accomplished? We have the amount of educated talent in our ranks, which would be required to discharge the duties involved in the prosecution of the proposed work. All that is necessary is to draw out, to enlist, and to interest that talent, and we shall find that we have it in abundance. All enterprises of this character require, to insure success, two principal things—men and money. The ranks of the profession will supply the first, the second must come from their pockets. A little calculation will show how easily the necessary funds could be obtained and how light the tax would really be which would yield sufficient means to place the whole enterprise upon a substantial basis. Let us suppose there are within the limits of the United States 10,000 intelligent dentists who can well afford to contribute to this important object. Suppose this whole number should each contribute $25 a year, for a period of four years. This light tax would yield the enormous amount of one million of dollars. If but one-half this sum were realized we shall have provided for a most evident present want. Some of the modes which suggest themselves for the accomplishment of this scheme are these: We must first arouse a deeper interest in the dental schools already established. We must relieve them from the pecuniary embarrassment under which

some, if not all, are now laboring. We must provide them with the needed appliances for putting their respective institutions into good working condition. They are in want of books for their libraries, furniture for their infirmaries, fixtures and machinery for their laboratories, preparations and specimens for their museums, chemical and philosophical apparatus, etc. The next important consideration is the establishment of an additional number of schools. So far as I know there are but five dental colleges in the whole United States: one in Baltimore, two in Philadelphia, one in New York, and one in Cincinnati. We want to enlist the whole mass of the profession in this subject. To do this it needs only that the subject shall be fairly uncovered, and laid before them. Our young men have a right to demand that we give them opportunities to educate themselves, for it is among them that the great work is mainly to be done. Once having provided ample educational facilities, we, in return, shall have the right to insist that every candidate, before assuming the high duties of a practitioner of dentistry, shall at least have passed the ordeal of a thorough examination before a properly constructed dental board, if we do not go still further and demand that he shall have graduated at a dental college.

Dr. Spalding considered this great question further, but the above were his principal points. He concluded with expressing a hope that the subject would be more fully considered by the Association.

At the conclusion of the Address, the Chair appointed Drs. W. H. Allen, of New York, and W. P. Horton, of Cleveland, to conduct the President elect to the chair.

Dr. Fitch thanked his brethren for the honor they had done him. The position, he said, imposed duties to which he was unused; but as dentists were supposed to be orderly persons, he trusted that his task might prove an easy one, and should throw himself upon their indulgence.

Reports of Standing Committees were now called for, the first in order being the Publication Committee; they reported as follows:

The Publication Committee regret to say that, owing to an inexcusable delay on the part of the person employed to furnish a phonographic report of the discussions at the meeting of the Association, held at Chicago, it has been found impossible to carry out the instructions relative to publishing a revised edition of the Constitution and Transactions of the Association from its formation to the close of the last session, in time for the meeting to be held at Boston. Every arrangement was made for the prompt appearance of the Transactions immediately after the adjournment of the last session, by carefully revising the Constitution and Transactions already published, obtaining an estimate of the probable cost of publication, etc., and the reporter at Chicago was repeatedly written to for his report; only within a very brief period, however,—too limited to get out the work in a creditable manner,—has the manuscript come to

hand. Under these circumstances, the Committee, acting under the advice and approval of the officers of the Association, have decided to merely publish, for the present, the minutes of the last meeting, along with the revised copy of the Constitution.

The Committee also suggested some changes in the Constitution, which were subsequently presented in a motion by Dr. Horne.

The Chairman of the Publication Committee asked instructions as to the propriety of engaging a stenographic reporter. After a general expression of opinion in favor of an accurate detailed report, the Committee was left to follow its own judgment.

The report of the Publication Committee was adopted.

Dr. I. Forbes, from the Committee on Prize Essays, reported that none had been presented.

The order of business was now suspended to receive a memorial from Drs. Atkinson and Keep, on behalf of a meeting of Dentists, in regard to the claims of the Dental Vulcanite Company, which was referred to a committee of five.

A resolution of thanks was then unanimously voted to the retiring officers; and the meeting adjourned to Wednesday morning at 10 o'clock.

SECOND DAY.—*Morning Session.*

The President, Dr. C. P. Fitch, called the meeting to order at 10 o'clock.

The minutes were read and approved.

On motion of Dr. Watt, an addition of three dollars per member was added to the constitutional assessment, making in all five dollars.

On motion of Dr. J. Warner, the following members were chosen to conduct clinics the next morning: Drs. I. J. Wetherbee, J. S. Knapp, W. H. Atkinson, C. Palmer, F. Y. Clark, G. A. Mills, W. H. Morgan, I. A. Salmon, C. R. Butler, J. Taft, H. J. McKellops, A. P. Southwick, W. H. Allen, G. L. Field.

The following amendments to the Constitution were now proposed by Dr. W. C. Horne, namely, to amend Art. III., Sec. 7, by adding the words: "nor shall any member be permitted to address the Chair more than twice upon the same subject—nor to consume more than fifteen minutes, unless by consent of the Association;" and to add a new section to the same article:

"SEC. 8.—Any act of special immorality or unprofessional conduct, committed by a member of this Association, shall be referred to the Committee of Arrangements, whose duty it shall be to thoroughly examine into the case and report at the next meeting, if the charges be sustained. Whereupon, by vote, the offending member may be reprimanded or expelled; a two-thirds vote being required for expulsion, a plurality being sufficient for reprimand."

Reports from Standing Committees being now called for, Dr. Watt reported the receipt of the following Voluntary Essays: On Dental Physiology, by Dr. J. Allen; on the Sacrifice of the Human Teeth, by Dr. J. S. Knapp; on Dental Ethics, by Dr. C. E. Latimer; on Dental Education, by Dr. J. S. Latimer, and by Dr. C. P. Fitch; on the Reproduction of the Alveolar Processes, by Dr. W. H. Atkinson.

The report of the Committee on Dental Physiology, by Dr. H. S. Chase, of Iowa City, was presented and read by Dr. W. H. Morgan, of Nashville.

On motion of Dr. Wetherbee, the Committee to consider the Memorial on the Claims of the Dental Vulcanite Company was increased so as to include one from each State represented in the Association, as follows: Drs. W. C. Parks, New York; N. C. Keep, Massachusetts; C. W. Spalding, Missouri; F. Y. Clark, Georgia; E. G. Cummings, New Hampshire; O. R. Post, Vermont; J. M. Riggs, Connecticut; J. C. Robbins, New Jersey; A. B. Robbins, Pennsylvania; W. H. Morgan, Tennessee; J. S. Knapp, Louisiana; G. L. Field, Michigan; B. T. Spellman, Ohio; M. S. Dean, Illinois.

A Voluntary Essay was now read by Dr. John Allen, on Dental Physiology; but before its conclusion, the hour having arrived for the Organ Concert, the Association proceeded to the Music Hall.

At half-past one the Association was again called to order, and Dr. Allen concluded the reading of his essay.

Dr. McQuillen then addressed the Association on the *interglobular spaces* in dentine, giving the results of some recent investigations on his part, and illustrating the subject by large drawings from two of his microscopical preparations. A careful but necessarily brief review of the appearance presented by sections of dentine and bone, under the microscope, was embodied along with the description of these spaces, which he said were generally found in the coronal dentine near the enamel, although they were by no means confined to that locality, but could sometimes be seen in other portions of the crown and even in the roots of teeth. He regarded them as *abnormal and predisposing to dental caries* when existing in fully-grown teeth, but that they could not be looked upon in that light in young and growing teeth, as subsequent calcification of these spaces might eventually obliterate them.

Dr. Allport said that nature worked regularly and with a definite design in creating all her works. The same hand that creates and moulds the type also arranges separate organs and tissues; and while the same classes of tissues and bodies may vary somewhat in size and shape, the type remains always the same. Nature, when uninterrupted, is not so crazy and uncertain in her action as to commence and conclude a certain tissue at a given point at one time, and at other times commence and conclude the same tissue at other and very different points. The natural

point for interglobular spaces in a healthy tooth is at the junction of the enamel with the dentine or cementum, and is always found there, unless thorough calcification has ensued. The dentinal tubes commence at this point, and, when not interrupted by some abnormal action in their formation, are continuous until they reach the pulp. The want of continuance in these tubes is owing to a lack of a proper assimilative force at the time calcification at this point was going on. When the interglobular spaces or granular masses are found within the dentinal structure, between the junction of the dentine with the enamel and the pulp, it is the result of an abnormal action, and should be regarded as a pathological rather than as a physiological condition.

Then, again, if it is, as Dr. McQuillen states it to be, a predisposing cause of decay, it is the result of a debilitated action in some particular function, which is of itself enough to stamp it at least as the *result* of a pathological condition. Hence I am of opinion that whether the drawing presented for our consideration be taken from a microscopic preparation of a developed or an undeveloped tooth, it should be considered as a portrait of a pathological condition, and not a normal one.

Dr. McQuillen, in response to Dr. Allport, said he had distinctly stated that the *interglobular spaces*, when present in teeth whose growth had been completed, were *abnormal, and predisposed* them to decay. As there appeared to be an evident misapprehension relative to the exact meaning of the terms *predisposing* and *exciting causes of disease*, he would endeavor to define them. By *predisposing cause* is meant a defective condition, either hereditary or acquired, of some particular organ or of the entire organism, which tended to the development of certain diseases from exposure to those external influences which are very properly denominated *exciting causes of disease*, such as sudden variations of temperature, inclement weather, insufficient clothing, food defective in quality or deficient in quantity, etc. If a person laboring under *predisposition* to a given disease should be protected from *exciting causes*, the former may lie dormant for a long life; and that which is true of other portions of the organism is equally true of the teeth. In other words, if teeth in which these spaces occur are protected from external influences, such as mechanical violence, acids, etc., which would act as *exciting causes of caries*, the *predisposition* to the affection on the part of the *interglobular spaces* would remain dormant.

Dr. Suesserott did not recognize the propriety of speaking of the interglobular spaces in growing teeth as abnormal, for subsequent calcification might obliterate those spaces. Upon the same principle it might be said that childhood is an abnormal condition, because disease prevails to a greater degree at that period, and the ratio of mortality is decidedly higher than in a maturer stage of life.

Dr. Atkinson said that the eye only sees what the mind conceives.

The condition presented in the drawing was evidently a pathological one. He did not believe KÖLLIKER ever saw that which was represented in the woodcuts, published in the translation of his work; it was not a properly prepared example, and others following him have only copied his error. It must be evident to the merest tyro that this was an abnormal condition. These apparent spaces were due to fortuitous circumstances in the preparation of the specimens; they were not true interglobular spaces. The difficulty was that men do not make their investigations for themselves.

At two o'clock the Association adjourned to meet at half-past seven. The members, under the direction of the Committee of Arrangements, were then massed upon the steps of the State House, where several photographs of the body were taken by A. Whipple, Esq., of Boston.

SECOND DAY.—*Evening Session.*

The President called the Association to order at 7½ P.M.

The minutes of the morning session were read and approved.

Dr. Watt, from the Committee on Dental Ethics, made a report, which was accepted, and ordered to lie on the table.

The discussion on Dental Physiology was resumed.

Dr. Atkinson desired to make his statement of the location of the interglobular spaces clearer. Their only proper or normal locality was at the commencement of the dentinal tubes, between the enamel and dentine and cement and dentine. The antagonizing forces at work here are the cause of the interglobular spaces, which are but the remains of the colloid mass deprived of lime-salts by the formation of the intertubular structure by calcification, rendering the mass poor in lime. The first appearance of this line of demarkation presents itself in the separation of the enamel pulp and the dentinal pulp, between which a magma of lime accumulates, which is the foundation of the enamel rods whose bases are stellate cells, which calcify, a cell at a time, from this toward the periphery of the tooth until each enamel rod is completed. A like effort at calcification going on from this point toward the centre is the cause of the dentinal structure, which would be one solid mass of connective dentinal or intertubular structure were it rich enough in lime-salts to supply the demand for hardness. The poverty of this colloid mass filling the tubes and interglobular spaces is the cause of its fluidity, or soft-solid condition, and in consequence of this becomes the medium of dentinal circulation, by which the nutrition of dentine and consolidation of the walls of the tubules and interglobular spaces is effected, reducing them more and more as long as lime is supplied in quantity sufficient to produce this hardening. The beautiful specimens here exhibited, if properly named, would not give rise to dispute at all. Interglobular spaces, correctly so named, are only to be found in the periphery of the dentine. The removal of the pulp does not

make a tooth a dead body; this is owing to the interglobular space acting as a bastion against which disintegrative agencies cannot successfully present themselves. We should not befog ourselves with adventitious pictures of adventitious specimens, nor by calling a pathological condition a physiological fact. If interglobular spaces are found anywhere else, they are owing to the antagonism of pathological conditions interrupting the normal development of dentinal tissue, which shows itself in the interrupted or diverted and deranged tubules of the part. A very little erudition may pass itself for great attainment, where the common level is but little better than a mere blank. There is scarcely a real, earnest, working, faithful histologist on this side of the salt pond; were it not so, there would be no room for those who copy mere mistakes and pass them as the demonstrations of nature's mode of constructing the tissues of the body. Had we but the alphabet of histological science well impressed upon our minds, there would be no room for the promulgation of mere opinions, but we would be able by proper management to reduce all our observations to the unmistakable demonstrations of clearly defined knowledge.

Dr. McQuillen did not consider the subject under consideration as a mere difference of opinion in relation to *technicalities* but that it had been made a question of *facts*. The preceding speaker, while admitting the evident accuracy of the large diagram here presented of a microscopical specimen which he had never seen, had endeavored to make one of two points in the long harangue with which the members had been favored; first, that the appearance of an engraving published in the DENTAL COSMOS in connection with an article on the "MICROSCOPY OF THE DENTAL TISSUES" (although it agrees in all essential particulars with the drawing by Mr. Pettit), was either due to the presence of air bubbles from defective mounting of the specimen in Canada balsam, or, second, that a mistake had been made by the engraver of the *American edition of* KÖLLIKER, and that writer should not be charged with an illustration which, it was more than probable, he had never seen, and when it was exceedingly doubtful about its bearing any resemblance to the one in the *German edition*. The Association had been informed very gravely that the use of the so-called "incorrect illustration" was a great *blunder*, and this remark had been made to Dr. McQuillen in Philadelphia a few weeks before by the same party, with the addition that "a *blunder* was worse than a *crime*." His response then, as now, was that the shallow sophism enunciated by that prince of scoundrels, TALLEYRAND, which some weak people were disposed to regard as an irrefutable aphorism, had no foundation in fact, or weight with sensible and just men. A *blunder* was never worse than a *crime;* the first implied an error of judgment or forgetfulness, and as all are liable to such things, there was a disposition on the part of men to forgive that in others which they were apt to commit themselves, while the second always

indicated premeditation and with a deliberate intention to do the wrong thing; and although guilty parties sometimes escaped the punishment they justly merited, their crimes when known were invariably borne in remembrance against them, and not unfrequently served to defeat some darling project they might have in view. PURKINJE, when he discovered the *lacunæ* and named them *corpuscles* or bodies, made a *blunder*, for they are not bodies but spaces; this, however, was only an error of judgment, which subsequent observers have corrected, and it was by no means worse than a *crime*. In the present instance, had the engraving referred to been taken from KÖLLIKER or his language used without due acknowledgment, it would not have been a *blunder* but a *crime*, which would have been so humiliating that the speaker could not, under such circumstances, have had the boldness to hold up his head in such an intelligent and honorable body as was there assembled.

In response to the two points dwelt upon, he would say of the first, that the air bubbles found in the defective mountings of microscopical preparations presented a very different appearance from that in the diagram objected to, as he was ready to demonstrate by a specimen in which the air bubbles existed; and of the second, that the engraver employed by him to illustrate the article in the DENTAL COSMOS, cut the leaves out of the American edition of KÖLLIKER and *transferred* the illustrations taken from it to the *block*, so as to secure more accurate representations than could be obtained by copying them with the pencil. The evidence of this was before them in the *book itself*, which the members could see gave unmistakable evidence of the mutilation it had been subjected to in order to be *correct;* with respect to the *German edition*, through the politeness of his friend and former fellow-student at college, DR. J. DA COSTA (the editor of the American edition), he had also an opportunity of *showing them the German work*, and stating, on the authority of DR. DA COSTA, that the American publishers, LIPPINCOTT, GRAMBO & CO., finding that it would involve an immense outlay to illustrate the work in this country, wrote to the German publishing house for all the cuts used in their edition, and that these were promptly forwarded and used. It is only necessary to compare the illustrations in the *German* and *American editions* of KÖLLIKER with those in the DENTAL COSMOS to see the exact resemblance they bear to each other.

In addition to his own investigations, which had been submitted to the Association, as further evidence of the accuracy of the objectionable engraving, he had seen in the library of the ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA, in SIEBOLD UND KÖLLIKER, ZEITSCHRIFT FUR WISSENSCHAFTLICHE ZOOLOGIE for 1850, a paper by DR. JOHANN CZERMAK, with illustrations of the *interglobular spaces*.

The doctor added that as the man who had constructed any article was far better qualified to describe its mechanism than one who had no

part in forming it, he would call upon Dr. G. S. Allan (a gentleman who had probably mounted more microscopical specimens than any other in our profession in this country), and upon Dr. J. S. Dodge, Jr., to give their views upon the subject under discussion.

Dr. Atkinson. There are two kinds of honesty: the one spontaneous and earnest, and not to be diverted from the pursuit of its purpose; the other the afterthought of policy. Whatever Dr. McQuillen may say now does not exculpate him from his former position published to the world. Mental labor arises from a sense of need or deficiency which throws us into a state of aspiration, which induces inspiration, which by the regular gestational motion serially becomes feeling, idea, thought, opinion, belief, and knowledge. We care much for and desire knowledge, respect belief, admire opinion, but lose our interest in the less perfect products of mental labor, to wit, thought, idea, and mere feeling.

Dr. McQuillen replied that in so far as the remarks of the last speaker were meant to intimate a failure on his part to give due credit in the DENTAL COSMOS for quotations and engravings, he would say that in the first part of the address alluded to, that credit had been given in the body of the article to a cut taken from PROF. LEIDY's work, and to still further satisfy the most hypercritical reader, a foot-note was appended to the continuation in the next number of the magazine, in which additional acknowledgments were made. He would not inquire into the motive which prompted such a remark, as it was quite transparent; he had always endeavored to make due acknowledgment to every one: his record was before the profession, and must stand for what it was worth.

Dr. Barker remarked that we were all too apt to be governed by authors of known and well-deserved reputation, but believed that every one should search out with the microscope for himself for these phenomena. He believed that this discussion would tend to produce that result, and therefore thought it would be productive of good. The question as to the presence of these interglobular spaces being indicative of a normal or abnormal condition was not a very important one, as even the advocates of the latter view did not contend that they acted as a predisposing cause of disease, except caries had first worked its way to their neighborhood.

Dr. G. S. Allan briefly supported the position of Dr. McQuillen; he did not agree in the opinion that these appearances could be accounted for by the presence of air or any defect in the mounting. He dwelt particularly on the fact that although the interglobular spaces are usually found a short distance from the enamel, they were by no means confined to that region, but could be sometimes observed in other portions of the crown, or in the roots of teeth, with the *tubuli passing directly across them.* Dr. Atkinson demanding his authority for such an assertion, he replied that he spoke of what he had seen under the microscope, and

offered additional confirmation, which he read from KÖLLIKER: "In the crown they (the interglobular spaces) are found most frequently in the neighborhood of the enamel, and often formed a thin, curved layer, extending along its whole inner surface, which, upon close examination, is seen to be composed of a multitude of thin layers receiving the ends of the contour lines. They also occur, however, more *internally*, but always in longitudinal sections in lines which correspond with the contour lines." * * "The interglobular spaces, whose presence is normal in developing teeth, contain during life, not fluid, as might at first be expected, but a soft substance resembling tooth cartilage, and possessing a canaliculated structure like the dentine itself."

Dr. Dodge said he had long been familiar with these appearances (interglobular spaces), and from the study of them had drawn certain conclusions concerning the growth of dentine. In examining certain sections of deciduous teeth, the following appearances were presented. (They were illustrated by diagrams on the blackboard.) Beginning at the outer edge of the dentine, the tubules presented the usual appearance, with a few circular markings, resembling partial outlines of interglobular spaces. After a certain thickness of this normal dentine, the whole appearance changed somewhat abruptly; the tubules became tortuous and branching, with a general direction, more nearly at right angles to the long axis of the tooth; and among them could be seen many of the circular markings, in some places crowded thickly together. The inner edge of the section was ragged or fringed, with the ends of the tubules prolonged more or less beyond the intertubular matrix. And in one specimen were visible fragments broken off in the grinding or mounting. These fragments were circular, of the same size as the circular markings in the dentine, and pierced with holes about the size of the tubules. These observations suggested that the calcification of dentine, after the stretching out of the future tubules, proceeded in nodules, or globular masses, which gradually extended and coalesced until in mature dentine all trace of this formative globular stage was obliterated; but it might often happen that this process would be arrested short of completion, and then would be left the circular outline or interglobular spaces, according to the greater or less approach to perfect calcification. The speaker pointed out that the outlines of interglobular spaces were formed by the intersection of circles, convex toward the space, which could not be always the case if they were merely appearances formed in the mounting, as had been claimed. He directed attention to the accuracy of the drawings of the microscopical sections prepared by Dr. McQuillen, in which the artist had followed nature in all the details.

Dr. Taft said that although he thought the subject under consideration a very important and interesting one, he did not like that the limited time, which could be devoted to dental physiology, should be oc-

cupied exclusively by it. He then entered into the view that these spaces predisposed to decay, and that when external agents acting upon the enamel and dentine induced dental caries, and that disease reached these spaces, it ran riot among them.

The order of business was now suspended to receive the report of the Committee on the claims of the Dental Vulcanite Company. The Committee recommended to the Association to create a Commission of five members, who shall raise funds, and, if satisfactory terms cannot be obtained from the company, in their discretion protect any member of the dental profession against claims of the company in all the courts of the United States.

After some debate, the report of the Committee was adopted.

Dr. I. J. Wetherbee moved that a committee of five be appointed to nominate commissioners. Which was carried. The Chair appointed Drs. McKellop, Horne, Lyon, Morgan, and Cushing.

The Committee met and reported; but some of their nominees declined, and the report was recommitted.

The Association then adjourned to Thursday morning at ten o'clock.

THIRD DAY.—*Morning Session.*

The meeting was called to order by the Chair at $10\frac{1}{2}$ o'clock. The minutes were read and approved.

Dr. Allport moved to make the selection of the place for the next meeting the special order for 2 P.M.

Dr. B. F. Arrington, of Wilmington, North Carolina, moved for the appointment of a committee to test certain preparations of gold for filling teeth. Carried.

The Chair appointed Drs. W. H. Morgan, C. R. Butler, G. A. Mills, J. S. Knapp, A. Lawrence.

By resolution of the Association, the Chair then appointed a Sergeant at Arms, Dr. A. Lawrence, to call in absentees.

The subject of Dental Physiology being resumed, Dr. Spalding said he could not allow the statement, that the interglobular spaces might be predisposing causes of decay to pass unchallenged. They were not causes at all, for disease must have penetrated some distance through the enamel before reaching them; though he would not deny that being reached its operation might be greatly facilitated.

On motion, the Association determined to hear the reading of all the reports and essays before proceeding to their discussion.

The Committee on Chemistry made no report.

The Committee on Dental Pathology reported through Dr. Atkinson, who was followed by another member of the committee, Dr. C. R. Butler; also voluntary essays, by Dr. J S. Knapp, on the Sacrifice of the Human Teeth, and by Dr. W. H. Atkinson on Reproduction of the Alveolar Processes; all of which were accepted.

Dr. W. H. Allen read a report on Operative Dentistry from Dr. Kennicott, of Chicago, who was unwell. Report accepted.

In the absence of the chairman of Committee on Mechanical Dentistry (Dr. Richardson, of Terre Haute), Dr. Field, of Michigan, read his report.

This gave way to the special order, at 2 P.M, the naming of a place for the next meeting.

On motion of Dr. Watt, supported by Dr. Morgan, and others, it was at length decided to meet at Cincinnati, Ohio. The announcement was warmly applauded.

The Association then adjourned at 2½ o'clock to the usual evening hour.

By invitation of the Massachusetts Dental Society and the dentists of New England present, the Association enjoyed a pleasant excursion down the harbor, from three to seven o'clock. A brief stop was made at Fort Warren, where the party left the steamer and strolled over the grounds, examining everything of interest. The trip was further enlivened by good music and an excellent collation. On returning to the dock, the members marched back in procession to the State House, where, in Doric Hall, under the flags of the Commonwealth, a humorous poetic welcome was read by Dr. John T. Codman, of Boston. The committee who got up the excursion were Drs. I. J. Wetherbee, E. G. Leach, T. B. Hitchcock, J. A. Salmon, E. C. Rolfe, B. S. Codman, A. Lawrence, J. H. Batchelder, N. C. Keep, and L. D. Shepard.

THIRD DAY.—*Evening Session.*

The meeting was called to order at 8 o'clock. The minutes were read and approved.

The Committee on Credentials made a further report, which was adopted.

The reading of the report on Mechanical Dentistry was continued to the end, and accepted.

Dr. G. A. Mills made a report on Dental Education, and Dr. I. W. Lyon read a voluntary essay from the pen of Dr. J. S. Latimer, which was followed by another from Dr. Fitch. They were all accepted.

The order of business was now suspended to hear the report of the committee appointed to nominate Commissioners on Rubber patents. The report was accepted and the committee discharged. The following nominations were finally confirmed: Drs. H. J. McKellops, St. Louis; J. M. Riggs, Hartford; A. Hill, Norwalk; E. G. Leach, Boston; W. H. Morgan, Nashville; C. W. Spalding, St. Louis.

The Nominating Committee then reported the Standing Committees for the ensuing year, and their report was accepted.

Dr. W. W. Allport offered a resolution, requesting the Publication

Committee of the last session to prepare for the printer the Transactions of the same, and put them in the hands of this year's committee before the first of September. Adopted.

The meeting then adjourned to Friday morning at 10 o'clock.

FOURTH DAY.—*Morning Session.*

The meeting was called to order at 10 o'clock, and the minutes read and approved.

Dr. McKellops, at his own request, was excused from serving on the Dental Vulcanite Commission.

The regular order being called, Dr. McManus presented a report from the Committee on Dentifrices, which was accepted.

On announcement that Governor Bullock was in the State House, a committee of three, Drs. Shepard, Spalding, and Lawrence, were appointed to invite his Excellency to visit the Association.

The report of the Committee on Dental Literature, by Dr. A. Hill, was read and accepted.

The regular order of business was set aside at 11½ o'clock, in order to receive His Excellency the Governor. A committee, appointed for the purpose, waited upon His Excellency and escorted him into the hall to the Speaker's desk, while the members of the Association rose and stood in their places. After a brief introduction by the President, and cheers from the members, the governor spoke as follows:

I trust, Mr. President, that this too kind introduction does not imply any obligation upon my part, either of courtesy or necessity, of making anything like an address to this Association. According to the very courteous invitation of your committee, it has been my great pleasure to present myself to-day to do honor to the attendance of this honored and respectable convention in the hall of the House of Representatives of Massachusetts. The House of Representatives have extended to the members of this convention permission and a cordial invitation to avail themselves of the use of this hall, and it only remains for me, sir, in behalf of the executive department of the government, to welcome you and the members of your body with equal cordiality to the capital of the Commonwealth of Massachussetts. (Applause.) I am impressed, sir, at the first sight, by the presence, by the individuality, by the whole appearance of your representative body. You represent what was formerly a small specialty in the department of medical science, or that which was at one time but a small branch of the great tree, which has become now almost as large as the trunk itself and overshadows the community by its services; which is as great for its usefulness as for its love for the good of the race, and you are its ornaments.

I am happy to believe also, Mr. President, that I have the honor to stand before gentlemen who, in their present capacity and experience, have been true friends of the virtue of their country.

But, sir, it is my only intention to accept the kind and courteous attentions of your committee, and present to you the cordial welcome of Massachusetts to all the members of your body.

Cheers were then given for Governor Bullock and the Commonwealth of Massachusetts, when His Excellency retired.

The regular order of business was then resumed, and the report on Dental Pathology and Surgery discussed.

Dr. Geo. T. Barker desired to call attention to a new method of treating anchylosis or immobility of the inferior maxillary. The patient was a girl, aged 11 years. When about five years old, while suffering from scarlatina, she contracted a severe cold; from that time all motion in the temporo-maxillary joints was lost. Plastic matter was doubtless effused into the joint, and converted into cartilaginous or osseous tissue. In consequence of disuse of the lower jaw, its growth was arrested, and the girl presented in consequence a very peculiar countenance. Atrophy of the muscles of the cheek had taken place, and the inferior incisors were thrown forward at an angle of forty-five degrees by the growth and movements of the tongue. This latter peculiarity enabled the child to push solid articles of food into the mouth between the superior and inferior incisors. Speech was not in the least interfered with. Learning that the different prominent methods of treatment had been tried without success, Dr. Barker resolved to make use of wedges of cotton, tightly packed between the molar teeth, changing them from day to day; the success was surprising, and every encouragement is given for a speedy and entire cure. The principal drawback being the atrophied condition of the muscles, which is being gradually overcome by friction and motion.

Dr. Kennicott proceeded to remark on the diagnosis and treatment of neuralgia. A case had come under his care, of a lady who had been confined to her bed for eight weeks, suffering from intense neuralgic pain; spasms occurred every three to five minutes, when he saw her, her friends hourly expecting her death. She had heretofore been treated constitutionally, but he at once suspected the cause to be local irritation. On examination, extensive alveolar abscess was discovered; the first and second bicuspids being implicated, the alveolus wasted, and the antrum penetrated, with free discharge through the nostril. Having anæsthetized the patient, he removed the teeth and dead bone, evacuating the contents of the antrum, which was then washed with tepid water, and stopped with lint saturated with tincture of opium. For five hours she experienced no return of the paroxysm, but when she was moved, felt some pain. This patient recovered rapidly, and had no return of the malady. In another case, a physician had treated a patient for scrofula, administering anodynes internally and externally. He soon discovered that the swelling under the chin, which had been supposed to be scrofulous, arose from a salivary calculus in the sublingual duct; with a lancet and excavator he

removed a calculus as large as a nutmeg, after which there was rapid recovery. He considered it the duty of the medical profession to have chairs of dentistry in their colleges, that medical students might be instructed in the physiology and pathology of the teeth.

Dr. J. S. Knapp had a patient sent him from an aurist in his locality, who requested that the nerve of a certain tooth should be killed. He found the soft parts suppurating, and thought best to extract the tooth, which he did; and the patient, who had been under treatment for deafness, almost immediately recovered her hearing.

Dr. Fitch found this subject one of great interest, having many phases. He had lately had under treatment a female patient, whose teeth presented a complication of difficulties; there were no less than four alveolar abscesses; with one exception these yielded readily to treatment. One over the left superior cuspidatus gave great trouble, discharging sanies and pus alternately. This was an abscess of nineteen years' standing, and for eighteen years whenever it pointed on the gum it had merely been opened. He discovered that the floor of the antrum was necrosed; he removed the dead portions and scraped the bones till there was a flow of arterial blood. (He remarked that the character of the bone might be known on touch, dead bone feeling rough, while live bone was firm, smooth, and velvety.) The parts were then touched with a saturated solution of resublimed iodine in creosote. In twenty-four hours there was much sloughing. At the next visit fine granulations had commenced. After this he proceeded mildly with his treatment, washing out the antrum with a weak solution of the chloride of zinc, and dressing with wine of opium, to induce healthy granulations, which in seven weeks had nearly closed the opening into the antrum. This case yielded readily to treatment, as there was no constitutional cachexia; the temperament was sanguino-nervous. By administering twenty grains of iodide of potassium daily, a constitutional condition was obtained, favorable to the production of cellular development, while the hypophosphites of iron were used as a tonic. A general knowledge of diseased conditions was indispensable to the treatment of such cases, in order to know when and how to treat, and when to stop. In this case of alveolar abscess, the cause of the trouble was the death of the pulp. If there were a fistulous opening in the gum, he should operate through that, smoothing the point of the root, that there might be no local irritant, and then filling the tooth perfectly, being sure that the foramen of the root was hermetically sealed, and proceeding with the treatment of the abscess as described. If there should be no fistulous opening, he would treat through the root, until the abscess healed. With proper care and skill, there need not be one tooth in a hundred extracted of those that now are.

Dr. Suesserott, while regretting that medical men know so little of dental pathology, was still more at a loss to account for the blunders,

piled one upon another, which occur in our profession. It was eminently proper that we should understand dental pathology. He should be the more careful of charges against medical men, as he acknowledged himself to be at times at fault. As an illustration, he mentioned an old gentleman, who suffered from paroxysms of neuralgia, so severe as to affect his whole system. He was without teeth. The branches of the nerves could be traced over his face, by the pain experienced at a slight touch. Doubtful of giving relief, he put an issue in the back of his neck, and treated the nerve branches for two weeks. His attention being then directed incidentally to the condition of the patient's stomach, this proved to be the seat of his disorder, and a cure was speedily effected.

Dr. Colburn deprecated the common practice of extracting diseased teeth; in the past he had been guilty with others; it was readily done, but they might be cured just as readily as if the trouble was with a finger. Merely opening the abscess, and dressing with creosote, would be sufficient to save a great many teeth.

Dr. Watt said that periodontal inflammation could nearly always be relieved by a mild course of iodide of potassium. In local effect potassium was pretty nearly nothing as compared with iodine, but chain the two together and they worked powerfully. Iodine by itself will act locally; potassium alone resolves itself into potassa, by its union with oxygen. He compared these agents to two fierce dogs let into the covert among the game; one would seize his prey and hold on to it, while his fellow performed the office of dragging out to the hunter. The dissolving power of potassium holds the evils in solution, while the iodine brings them out to the surface. He had seen it come out of the sublingual ducts, the Schneiderian membrane, in the secretions from the kidneys, not as iodide of potassium, but iodine; he did not know that it came out of the pores of the skin.

Dr. Buckingham. Iodide of potassium is always eliminated as iodic acid.

Dr. Atkinson. When we compare what we know with the great unknown, we may very properly place our hands on our mouths, and our mouths in the dust, and cry mightily to be delivered from the *painful sense* of our *ignorance*, and gladly accept the emancipation without too closely scrutinizing the means. We are all a tissue of inconsistencies in our knowledges and our practices; fearing the power of past and present authorities, we are apt to crush out the fresh inspirations, born of our necessities, that would, if followed, certainly lead us in the way of correct and successful practice, if we were only obedient to these rather than orthodox authority. Whenever the subject of chemical affinity is broached by one at home in chemical science he felt exceedingly small, and was ready to listen, that he might learn. Details of cases are often invidious, because partially reported; nevertheless, he felt disposed to report a case

indicative of how easy it is to be mistaken in the prognosis. It began by elongation of the superior central incisor, which induced the patient to call upon her dentist, who stood high in the profession. She expressed to him her fears of the death of the pulp, but he assured her she need have no uneasiness on that account, and proceeded to file it to a level with the other tooth, which operation was absolutely painless; confirming her in her first opinion, he persisting in his. The tooth continued to elongate, and was from time to time repeatedly filed as it projected, until abscess finally declared itself, when she became disgusted with dentists, and applied to a surgeon of worthy distinction, who pronounced it disease of the antrum, and boldly entered the same, finding it perfectly healthy. Nevertheless, he bored away with a cone of Squib's nitrate of silver, dismissing her as cured in three weeks. Upon her return home one abscess after another followed upon the death of the incisors, bicuspids, and molars, for the space of fourteen years, during which time she was, at intervals, under the care of this surgeon, and he (Dr. Atkinson) verily believed she was made worse by his treatment. Two years ago she called upon her surgeon, who said there was no trouble that nature was not sufficient to take care of, though pus and sanies were oozing from the fistulous openings. The patient, finally disgusted, called again upon a dentist, who advised her to apply to a certain humble individual. He made exploratory operation for three days, then removed dead and dying bone. The patient was exceedingly anxious to know the diagnosis and prognosis of the case, and was informed that it would probably take eighteen months to complete the cure, the first six weeks of which it would be desirable to see her daily. This was the honest conviction at the time, but in one day short of three weeks the patient was allowed to go home. Perfect reproduction was obtained, except a cavity at the site of the right superior lateral incisor (one-quarter of an inch deep on its anterior and one-eighth of an inch on its posterior aspect), filled with transparent colloid mass, on which the print of the rugæ of the finger remained, the evidence that further treatment was unnecessary.

That portion of the bone which was already dead was divided from the alveoli to the periosteum by a thin, narrow file, and enucleated with a spud from the soft parts, then readily removed by pliers. That portion in a dying state was rasped off with a coarse burr, until the living bone was reached, which may always be known by the peculiar feeling under the instrument, and the flow of fresh arterial blood from the capillaries in the cancellous and dense bone. After this the debris of bone was carefully washed out with a syringe charged with warm water, in which was a few drops of tincture of arnica, then a solution of chloride of zinc (twenty grains to the ounce of water) was thoroughly thrown into all the windings of the chasms from which the dead parts had been removed. Simple arnica-water dressings on pledgets of cotton, as large

as the pocket was desired to be, reduced from day to day as the colloid exudate filled up the cavity, completed the cure in the unexpectedly short time above named. The only constitutional treatment resorted to was full doses of the bromides of potassium and ammonium, to which was added a few grains of sulphate of quinine.

Dr. McQuillen said that there was too much of a disposition on the part of the people to be physicked, and of *some* medical men and dentists to physic them to their hearts' content. Certain gentlemen of his acquaintance evidently had, for instance, *creosote* and *iodine* on the brain, for with them these agents apparently did *everything* and *nature next to nothing.* Prof. Holmes, who had facetiously named this truly classic City of Boston, Hubtown, drew down upon him, a short time back, the anathemas of all the legalized quacks in the land, for daring to assert that, with some few exceptions, "if the materia medica, *as now used,* could be sunk to the bottom of the sea, it would be all the better for mankind, and all the worse for the fishes." For saying this he had been subjected to misapprehension and misrepresentation on the part of some good men; but what he there objected to was the *abuse,* not the *proper use* of drugs, and in that opinion every rational person, be he patient or practitioner, must unite. If all practitioners were more careful in impressing upon the minds of their patients the necessity of a strict observance of hygienic laws, and the latter more disposed to follow them, there would be much less suffering in the world, and less occasion for the use of drugs in the treatment of disease. For his own part, he relied more upon diet and rest, judicious exercise, bathing, clothing, protection from extremes of temperature, etc. than the pharmacopœia. The doctor then referred to the case of a distinguished advocate, whose professional duties were so exacting as to require the utmost application on his part. This gentleman called upon him during the extreme cold weather of last winter, desiring relief from intense and constant neuralgic pain in the right side of the face, which was aggravated by the slightest movement on the part of the lower jaw, or exposure to the cold air. Having examined his teeth carefully, and found that they were not the cause of trouble, the patient was informed of the fact, and that possibly the pain was due to irritation of some remote part of the nervous system, which the mind instinctively referred to a locality where no disturbance existed, or it might be owing to an osseous tumor pressing upon one of the branches of the fifth pair of nerves, or compression of them, in passing through one of the foramina, from osteal or periosteal thickening; he believed, however, that excessive professional labor, defective assimilation of food, combined with exposure to an extremely depressed temperature, which drove the blood from the external surface of the body back upon the nerve centres, had more to do with the difficulty than anything else. The patient was advised to rest from his professional duties, pay attention to his diet, ob-

tain all protection possible from warm clothing, and in particular to seek for the time being, if possible, a more genial climate. A trip to Cuba was taken, and the gentleman returned greatly benefited in every respect, and relieved in particular from his intense neuralgic pains. That they may return is of course possible, but there had been no painful manifestation up to the present time.

Dr. Butler gave additional testimony in the same direction. A female patient of his had such severe facial neuralgia that she refrained from food for weeks; her condition became such that fears were aroused of mental derangement. He removed two lower teeth on the right side, and after two or three days there was a moderation of the pain, which fluctuated. He insisted on her taking food, that nervous action might be called off in a different direction. After a week she was induced to take nourishment, when her pain began immediately to subside, and gradually she was restored to her normal health.

Dr. Wetherbee had had a patient of nervo-bilious temperament who was troubled with neuralgia for seven years, and could not recline in her bed during that time. He extracted eight inferior teeth, and immediately she was relieved, and never had a recurrence of the pain. The teeth extracted were in a healthy condition, and he could only account for the pain by the supposition of some irritation of a part of the fifth pair of nerves.

Dr. F. Y. Clark called attention to a condition of the teeth of children in his locality, which he regarded as epidemic. A case in point was that of a little child; the gums and teeth were slightly irritated; the attending physician used mercury and other agents unsuccessfully. After some months several teeth were found loose and discharging pus. He used a disinfectant until there were positive signs of exfoliation, then removed the dead teeth and bone, washed with sulphate of zinc and acetate of lead, and in a few weeks there was a perfect cure, and the same in other cases. Knowing no cause for this condition he asked for information.

Dr. Barker said we often look for obscure causes of disease when, were we but to use our eyes, they would be readily apparent to us. In most of the cases as instanced by the previous speaker, the children thus diseased would be found to be suffering from perverted nutrition, being of what was termed a scrofulous diathesis. The cure of such cases could only be effected by a change of diet and general surrounding influences, accompanied with such remedial agents as would tend to increase, by their special and remote influence, the quality and quantity of the blood. When this change could be effected, the return to health would, in most cases, be a speedy one. Of diseased antrum he wished to say, that it was not infrequent for it to be claimed that such a pathological condition was cured by this or that local remedy. Without desiring to doubt the efficacy of topical applications, he believed that one of the most successful treatments was to allow free exit for abnormal secretions. It is not suffi-

cient to evacuate the contents occasionally, but it must be done daily, and sometimes oftener, as the presence alone of these degenerated secretions will excite an unhealthy action in the lining membrane of that cavity. The topical applications should be of the nature of mild astringents and antiseptics, one of the most successful of which in his hands was pure cider vinegar, commencing with the strength of one part of vinegar to eight of water, gradually increasing until it can be used undiluted.

Dr. Kennicott at one time was consulted by a large, strong man, suffering from facial neuralgia; he had in vain sought eminent medical advice. He mentioned having had his skull cracked, many years back, by a rake falling upon it. Prof. Freer said that in healing there had been probably a thickening of the bone, which caused pressure on some nerve branch. Dr. Kennicott blistered the surface, and applied upon it a weak solution of aconitine; for a week the patient was relieved, but the pain returned after that time. Dr. Flint then performed an operation on the skull, which proved that there had been pressure upon the supra-orbital nerve.

Dr. Fitch proceeded to lay down the general principles which regulated his treatment. Every healthy action was nutritive in its character, and disease but an interruption of nutrition in its appropriative and eliminative acts. The children referred to were poisoned with effete matter retained in their systems, which suspended nerve action, and that was equivalent to life action. It should be borne in mind that the processes were lower in their grade of development than bone. In incipient alveolar abscess it should be ascertained whether there is any devitalized dental pulp; if so, cleanse the root of the tooth by making a direct opening and evacuating the matter. To cut off the action of the nervous force he uses the alcoholic extract of aconite root, two or three drops being a dose; which, acting as a powerful venous and arterial sedative, will keep the parts at rest. Fill the root as soon as prepared. If the abscess involved the socket cleanse the exterior of the root, and treat for the hugging down of the gum. He would not say that he ever got an attachment of the periosteum to the cementum.

Dr. Clark said all were willing to attack those cases with which they were familiar, while the obscure ones got the go-by. He referred to teeth whence there was an almost imperceptible discharge; if prematurely stopped up they would prove as dangerous as a powder-magazine. He was very cautious in dealing with such. He removed the most decayed portions at the first sitting, and applied creosote, to be followed at another time by the acetate of lead, and not until after this preliminary treatment would he attempt thoroughly to cleanse the root, lest some of the debris should choke up the foraminal opening before the discharge was healed. His method of filling roots was to prepare a pivot of orange wood, and when this was got into just the right shape, reproduce the

same proportions in hickory, which was to be pressed home and filled over with gold. He claimed for this method that it preserved roots fifteen to twenty years.

Dr. Allport said there could be no originality claimed for this process, as it was used by Dr. W. H. Kennicott, of Chicago, twenty-five years ago.

Drs. Lawrence and Colburn asserted their knowledge of such operations twenty to twenty-five years since.

Dr. Fitch said it was a matter of no consequence with what the root was filled so the substance was incorruptible, and sufficed to seal the root hermetically, after the abscess was healed, or before if there were a fistulous opening.

The Association then adjourned to $7\frac{1}{2}$ o'clock P.M.

In the interval many of the members visited the museums of Professors Agassiz and Warren, and other objects of interest in the city.

FOURTH DAY.—*Evening Session.*

The President called the meeting to order at a quarter to eight o'clock. The minutes of the morning session were read and approved.

The report of the Committee on Dental Ethics was now presented by Dr. Watt, Chairman of the Committee, read and accepted. It was then moved that it be read and adopted section by section, which was done; and after some slight alterations, stands as follows:

Code of Dental Ethics, adopted at the Sixth Annual Session of the American Dental Association.

ARTICLE I.—*The Duties of the Profession to their Patients.*

SEC. 1. The dentist should be ever ready to respond to the wants of his patrons, and should fully recognize the obligations involved in the discharge of his duties toward them. As they are, in most cases, unable to correctly estimate the character of his operations, his own sense of right must guarantee faithfulness in their performance. His manner should be firm, yet kind and sympathizing, so as to gain the respect and confidence of his patients; and even the simplest case committed to his care should receive that attention which is due to operations performed on living sensitive tissue.

SEC. 2. It is not to be expected that the patient will possess a very extended or a very accurate knowledge of professional matters. The dentist should make due allowance for this, patiently explaining many things which may seem quite clear to himself, thus endeavoring to educate the public mind so that it will properly appreciate the beneficent efforts of our profession. He should encourage no false hopes by promising success, when, in the nature of the case, there is uncertainty.

SEC. 3. The dentist should be temperate in all things, keeping both mind and body in the best possible health, that his patients may have the benefit of that clearness of judgment and skill which is their right.

Article II.—*Maintaining Professional Character.*

Sec. 1. A member of the dental profession is bound to maintain its honor, and to labor earnestly to extend its sphere of usefulness. He should avoid everything in language and conduct calculated to dishonor his profession, and should ever manifest a due respect for his brethren. The young should show special respect to their seniors; the aged special encouragement to their juniors.

Sec. 2. The person and office arrangements of the dentist should indicate that he is a gentleman; and he should sustain a high-toned moral character.

Sec. 3. It is unprofessional to resort to public advertisements, cards, handbills, posters, or signs calling attention to peculiar styles of work, lowness of prices, special modes of operating; or to claim superiority over neighboring practitioners; to publish reports of cases or certificates in the public prints; to go from house to house to solicit or perform operations; to circulate or recommend nostrums; or to perform any other similar acts.

Sec. 4. When consulted by the patient of another practitioner, the dentist should guard against inquiries or hints disparaging to the family dentist, or calculated to weaken the patient's confidence in him; and if the interests of the patient will not be endangered thereby, the case should be temporarily treated, and referred back to the family dentist.

Sec. 5. When general rules shall have been adopted by members of the profession practicing in the same localities in relation to fees, it is unprofessional and dishonorable to depart from those rules, except when variation of circumstances requires it. And it is ever to be regarded as unprofessional to warrant operations or work, as an inducement to patronage.

Article III.—*The Relative Duties of Dentists and Physicians.*

Dental Surgery is a specialty in medical science. Physicians and dentists should both bear this in mind. The dentist is professionally limited to diseases of the dental organs and the mouth. With these he should be more familiar than the general practitioner is expected to be; and while he recognizes the superiority of the physician in regard to diseases of the general system, the latter is under equal obligations to respect his higher attainments in his specialty. When this principle governs, there can be no conflict or even diversity of professional interests.

Article IV.—*The Mutual Duties of the Profession and the Public.*

Dentists are frequent witnesses, and, at the same time, the best judges of the impositions perpetrated by quacks; and it is their duty to en-

lighten and warn the public in regard to them. For this, and the many other benefits conferred by the competent and honorable dentist, the profession is entitled to the confidence and respect of the public, who should always discriminate in favor of the true man of science and integrity, against the empiric and impostor. The public has no right to tax the time and talents of the profession in examinations, prescriptions, or in any way without proper remuneration.

This code elicited much discussion, and no little opposition. It was particularly urged by members practicing away from the large cities.

Dr. McQuillen, a member of the Committee, stated that he had read the code, but could claim no credit for its preparation; on general principles was opposed to its adoption, as unnecessary for gentlemen, and its enforcement impracticable upon those who were not.

The final vote was at a late hour ordered and carried.

Dr. Allport presented a resolution relating to fees, which was opposed by Dr. McQuillen as beyond the proper limits of the Association. The resolution was lost.

Dr. Kingsley moved that the Association proceed to fix the time of final adjournment.

Dr. Watt opposed an early adjournment, and moved that the time be fixed for next Wednesday at 10 P.M.

This motion was laid on the table.

The Association then adjourned to Saturday at 9 A.M.

(To be continued.)

REPORT OF DISCUSSIONS OF THE SOCIETY OF DENTAL SURGEONS OF THE CITY OF NEW YORK.

BY J. S. LATIMER, D.D.S.

AT a meeting held May 9th, the President, Dr. C. P. Fitch, being in the Chair, Dr. Kingsley made some interesting remarks upon the subject of the evening, "Cause and Treatment of Irregularity," and illustrated his ideas with diagrams upon the blackboard.

He said that those cases in which the superior incisors are "overhung"—superior incisors protrude too much—are always among the most difficult to reduce, and produce the greatest deformity. In such cases, he would wait until the superior canines were erupted and nearly completed before interfering. He is wise who knows when to operate, and when Nature must be let alone.

If the teeth are allowed to resume their former positions, they will become firm sooner than they would have done in the new, though reproduction is not more rapid than original growth. It should be borne in mind that the apex of the root is a fixed point, except so far as rotation, drawing the tooth partially from its socket, or pushing it further into the alveolus is concerned. Would not hesitate to move a tooth before the

apicial portion of the root is fully developed. Teeth should be moved as early as possible.

There is nothing to be gained by moving teeth which will be driven back by the occlusion: the operator should examine with reference to this in the first place.

Described his treatment of a case of overhanging incisors which he commenced during the first week of March, and completed in the last week of the following month.

He accomplished most satisfactory results in that brief time, by employing a vulcanite plate extending across the arch, and impinging upon the first molars and two or three adjoining teeth. Across from near one first molar to the other he drew a rubber string. A T-shaped piece of gold or platinum, having a hook at the bottom of the shaft, was then drawn between the centrals so as to permit the horizontal portion (as seen above) to rest upon the labial surfaces. The string of rubber was then drawn forward and attached by the hook. By means of this simple apparatus he kept a constant traction upon the incisors, and speedily brought them to the desired positions. Of course the horizontal portion of the T is curved a little to adapt it the better to the labial surfaces of the incisors.

Exhibited casts showing progress in a very marked case of "overhanging" and described apparatus, then being worn, with which he was forcing the protruding teeth backward and upward. The teeth were very long and conspicuous. If he carried them *merely* backward, they would overlap and entirely obscure the inferior incisors. This would leave them unsightly, so he determined to shorten the exposed portions of the crowns by forcing them upward into their sockets. The apparatus consisted of a gold band or plate resting against the labial surfaces and cutting edges of the teeth, to which elastic straps were attached; and these were fastened to a cloth cap resting on top of the head.

Dr. Frank Abbott had doubts concerning the doctrine advanced by the gentleman—that the apex of the root of a tooth which is being displaced from its original position, remains unmoved.

Dr. I. W. Lyon had not succeeded in expanding the arch, as Dr. Atkinson claims to have done.

Dr. Geo. H. Perine had expanded the arch with sticks. Has a case on hand now in which he is accomplishing the same purpose with an inclined plane.

Dr. Frank Abbott has trouble to persuade his patients to be faithful in wearing the apparatus. Has two cases now on hand which trouble him very much. Both are "underhung" and extreme cases. Is employing plates with elastic bands extending over the head, to be worn at night.

Dr. I. W. Lyon had been unfortunate with inclined planes. Three cases in which he had tried them had the occlusion so impaired that he feared he had done harm rather than good. Had been using bands in

front of the teeth to be moved outwardly, with which he used rubber ligatures—sections of tubing.

Dr. Fitch does not like the inclined plane. Claimed that the point or apex of the root does not move, and said the process is thicker and less yielding about the apex. In moving a tooth, the motion should be rapid enough to invite blood sufficient to the part to keep up the right degree of nutrition. Did not think the pulp would die without extreme inflammation. In old people the motion must be slow. Thumb-sucking will produce deformity. Had a case in which a central that he had moved came down longer than its mate; but the difficulty corrected itself without assistance. He claimed that the apex of a tooth is always in its normal position, though the presentation may be abnormal.

May 23d, President in the Chair.—Subject—"Disease of the Antrum."

Dr. Atkinson read a paper on "Teachers of Dentistry—What have they been, What are they now, and What ought they to be?" Ordered published.

Dr. C. E. Latimer read a paper on "Diseases of the Antrum."

During the discussion which followed the reading of the papers, Dr. Atkinson said that it is a mistake to inject the antrum when the syringe fills the only opening. He perforates the chamber at two points, generally through one of the alveoli and the buccal plate. Air should be allowed to occupy the cavity instead of the injected fluid. Thought many cases, *called* diseases of the antrum, were merely fistulæ *terminating* in the antrum.

Thought the essayist had not consulted his Dispensatory before preparing his aqueous dilutions of tr. iodine, or he would have discovered that iodine is soluble in water only to an exceedingly limited extent. Hence the gentleman probably has a precipitate of iodine at the bottom of his bottle.

Dr. John Allen makes apertures as described by Dr. Atkinson. Prefers a weak solution of the argenti nitras as an injection at the beginning of the treatment.

June 6th, President in the Chair.—Subject—"The Mallet in Filling Teeth."

Dr. C. E. Latimer took occasion, before the reading of papers, to present for examination four specimens of aqueous dilutions of tr. iodine of differing strength, in which the degree of dilution was plainly indicated by the color, and there was no sign of precipitation.

Dr. Atkinson read a criticism on Prof. McQuillen's paper on "Microscopy of the Dental Tissues," claiming, among other things, that the cut marked "Fig. 5," representing the interglobular space as midway of the dentinal tubuli, instead of at the periphery of the dentine, is grossly incorrect and calculated to mislead the inquirer who has not the benefit of

a good microscope. He also severely criticised the paper of Dr. Castle, published in a late number of the DENTAL COSMOS. Speaking of the automatic mallet, he said he did not like any that he had seen, because they have no brains.

Dr. J. Colburn spoke in favor of the mallet, but did not like the automatic instrument, on account of the great labor required to work it.

Dr. J. C. Robbins thought well of the spring-head mallet invented by Dr. Colburn.

Dr. Fitch thought the spring-head mallet would be less effective and quite as painful as the ordinary. Is often compelled to resort to general treatment to overcome dental irritation.

Dr. Frank Abbott thought the automatic mallet better than none. Can use the ordinary mallet in almost every case—very rarely having a patient complain of anything unpleasant in connection with its use.

Dr. C. E. Latimer said some malleters use a pushing instead of a sharp, lively blow; such should either be taught better, or employ a mallet having a spring handle.

June 20th.—Subject—"Glasses in Dental Operations."

Dr. B. W. Franklin read a paper on the subject of the evening, in which he took exceptions to theories of sensitiveness of the dentine, founded on the supposition that the contents of the tubuli are liquor sanguinis instead of fibrillæ, as described by Tomes. One of these theories imputes to the fluid contents of the tubuli the ability to vicariously perform the function of nerves of sensibility, while the other claims that compression collapses the tubuli, forcing the fluid within them against the pulp.

He thought that one of our body, who claimed to have seen red blood flow from the dentine when the pulp was neither exposed nor wounded, must have been wearing some very peculiar glasses.

Dr. Atkinson read an essay on "Glasses in Dental Operations," in which he spoke of the great importance of the microscope, and urged all to procure and use one.

Dr. C. E. Latimer presented a Coddington lens suitable for the dental case. He described the lens as being of the hour-glass form, and, unlike the Stanhope lens, which it greatly excels, the two surfaces have the same degree of convexity. Occasionally used a mouth-glass not larger than a dime. He took occasion to remark that some teeth he had filled with adhesive foil had discolored in consequence of leakage; since which he had been careful to place soft foil next the walls.

Dr. J. S. Latimer said mouth-glasses, as usually prepared, will not remain perfect if dipped in tepid water, as we habitually and necessarily do. He gave the following formula for silvering mirrors, which he had received from Dr. A. M. Edwards, President of the American Microscopical Society.

Make solution of pure argenti nitras grs. xij, distilled water f℥i, then add, drop by drop, stirring violently, aqua ammonia fort. until all the precipitate is redissolved—*and no longer.* Bottle, mark it No. 1, and keep it in a dark place. Next take Rochelle salts grs. xij, distilled water f℥i.—M. Bottle, and mark No. 2. Cleanse the glass with strong aqua potassæ, then with nitric acid. Wash with clean water, and dry with very soft, clean cloth. Avoid touching with the hand the surface to be coated. Now place the glass perfectly horizontal on the sill of a window into which the sun is shining. Place a book or other convenient object so as to shut off the direct rays of the sun until you are ready. Mix equal parts of preparations No. 1 and No. 2, as much as you think can be retained upon the glass. Then with a glass tube having a very small opening at the point, very carefully "pile" the solution on the glass until it stands from $\frac{1}{4}$ to $\frac{1}{3}$ of an inch high. Now remove the book and let the direct rays of the sun fall upon the fluid for an hour or two, when the silver being all precipitated, you may rinse off the fluid with clean water; dry and carefully cover the silver with a little black varnish. In applying the fluid to the glass, take care that the tube does not *touch* the glass, else you will have defective spots.

Dr. Atkinson claimed that the dentinal tubuli are filled with fluid during the vitality of the tooth; but after the tooth has been removed from the jaw, their contents are semi-solid. This accounts for the fibrillæ in mounted specimens.

THE IOWA STATE DENTAL SOCIETY.

This Society held its annual session at Burlington, Iowa, on the 11th, 12th, 13th, and 14th of July. There was a full attendance. A number of essays were read, and animated and interesting discussions followed.

Dr. Poor, of Dubuque, exhibited a "Piston Mallet Plugger," which was voted to be the best instrument yet invented of that kind. A clinic was held in which its working qualities were demonstrated.

The present officers of the Society are:

President.—W. O. Kulp, Muscatine.

Vice-President.—H. D. Bronson, Burlington.

Corresponding Secretary.—H. S. Chase, Iowa City.

Recording Secretary.—J. Hardman, Muscatine.

OBITUARY.

Drowned, in the St. John's River, Florida, on the 4th of April, D. C. Ambler, M.D., dentist.

It is a sad duty to record the sudden death of so highly respected and beloved a member of the profession. Dr. Ambler practiced for many years in the City of New York, but for the last few years has resided in Florida. His circle of acquaintances was large, and men of education, re-

finement, and worth were numbered among his most intimate friends. Like all good and useful men he had a few enemies, but they were chiefly, if not solely, of his own profession, envious of his reputation and success.

He was a favorite pupil of the venerable Dr. Valentine Mott, and graduated at the College of Physicians and Surgeons of the City of New York. His love of mechanics and chemistry, aided by an inventive and fertile mind, enabled him to make rapid advances in dental surgery, which he chose as a specialty. He was awarded, in the year 1833, by the American Institute a gold medal for artificial mineral or porcelain teeth, the first awarded, it is thought, for any manufacture. He thus gave an impetus to this important and growing branch of dentistry, the growth of which has been so rapid that it has become a specialty, giving employment daily to hundreds of busy hands. Sickness in his family called him away from this field of usefulness to another in the sunny South, leaving to others the laurels and riches which he truly merited.

I had the pleasure of meeting him in New York last fall when on a visit from Jacksonville. On that occasion he entertained me with an account of the many difficulties encountered by the early plodders in the field of dental surgery, giving a history of his travels through the South, with a few incidents in the practice in this country of the now-famed Dr Brewster, with whom he was intimate. I little thought then that it would be the last time that I should look upon his pleasant and genial face, the last time that I should listen to his cheerful and instructive conversation. Truly, "in the midst of life we are in death!" He was a sincere Christian, a member and communicant of the Protestant Episcopal Church; and those left behind mourn not for him as those without hope, for having finished his course in faith, he now rests from his labors. A. T.

At a meeting of the Society of Dental Surgeons of the City of New York, held at their room, No. 24 Cooper Union, on the evening of the 25th of April, 1866, the death of D. C. Ambler, M.D., dentist, was announced to the meeting, when on motion a committee of three were appointed by the chair to draft suitable resolutions of the exemplary character and exalted professional worth of the deceased.

The unexpected close of an eventful life in a career of enterprise and usefulness, cannot fail to arrest the attention of the most thoughtless, and shroud an appreciative community in the deepest gloom. Such was signally the case when the startling intelligence of the sudden death of Dr. D. C. Ambler by drowning, on the 4th of April, in the St. John's River, Florida, reached us. In Dr. Ambler we recognized an old, familiar friend and professional brother whom we all delighted to honor while living and now sincerely mourn his death. Dr. Ambler was one of the pioneers in the profession of dentistry; one who labored hard to elevate the standard of professional excellence, and the science and art of dentistry was materially advanced by his scientific knowledge and ingenuity,

and to his experimental researches is our profession indebted for those improvements in mineral teeth, the manufacture of which has been carried on so extensively and with such perfection in this country; therefore be it

Resolved, That this Society show its affection for the many virtues, and appreciation of the bright example of our departed friend and brother by placing on record these expressions of our bereavement and sorrow for his departed worth.

Resolved, That our sympathies, true and heartfelt, are hereby tendered to the relatives and friends of the deceased, in this sad and inscrutable dispensation of Providence.

Resolved, That Dr. John Gardner Ambler, one of our members and nephew of the deceased, be requested to address the profession at such time and place as may be convenient to himself, in an *obituary* or *eulogy* of the deceased.

Resolved, That these proceedings be published in one or more daily papers of this city, and in the dental journals.

All of which is respectfully submitted.

T. H. Burras,
John Allen,
Chauncey P. Fitch, } *Committee.*

BIBLIOGRAPHICAL.

Transactions of the Connecticut State Dental Association.—The dental profession of Connecticut, one of the smallest States in the Union, so far as extent of territory is concerned, have given evidence, during the past two years, of a spirit of progress worthy of imitation on the part of some other sections of the country. In that period four dental societies have been formed within the borders of the State, and are now in active operation, exercising a beneficial influence on the destiny of the profession. The desire for increased knowledge is not confined, however, to this State alone, but, speaking from personal observation, is markedly manifest throughout New England at the present time; for although somewhat tardy in entering upon associated effort, now that the spirit has been awakened in that direction, the profession there have engaged in it with that characteristic energy and devotion which is always evinced by that people in any object or cause they may espouse. One of the fruits of this upheaval, is the first volume of the Transactions of the Connecticut State Dental Association, a highly creditable work of one hundred and two pages, embracing the essays and discussions of a body of as earnest seekers after truth, and as ingenious and skillful men as can be found anywhere in the ranks of the profession. It is to be hoped that this Association will continue the course it has adopted of publishing its Transactions; and that other societies may follow its example, and thereby give unmistakable evidence of vitality. J. H. M'Q.

PERISCOPE OF MEDICAL AND GENERAL SCIENCE IN THEIR RELATIONS TO DENTISTRY.

BY GEO. J. ZIEGLER, M.D.

"*Degeneration of the Human Race from residing in Crowded Cities.*—There can be little doubt that about the great centres of civilization man is carrying out his sociable tendencies to such an extent as to detract considerably from the enhancement of his personal welfare, looked at in a physiological or medical point of view. He has become so fond of his neighbor, and his neighbor so fond of him, that they are almost inseparable. Their friends are in the same way of thinking, and hence all join company and form compact fraternization. But the consequence is, that they are in too close contact, and so continuously add to their number that at length they scarcely allow themselves room to move. There is no fresh air for them; they are forced to breathe their own and their neighbors' exhalations over and over again. There are so many of them in so small a space that they cannot well get rid of their refuse matters, scarcely of their own excreta. If anything in the shape of an infectious disease attacks one, it spreads like wildfire, of course, among the others; and even moral delinquencies are found to be in the same way catching, for if a 'black sheep' gets among the flock, it is well known that 'evil communications corrupt good manners.' If the consequences, then, of this social agglomeration be, on the one hand, increase of political power, of wealth, of commercial and social prosperity, and successful competition with other nations, they are, on the other, an overtaxing of the physical and mental energies at our disposal, and a premature consumption of national life-blood. To see all this we have but to scrutinize the character and results of that which has been called in recent days the 'great town system.' To witness it in perfection we should observe the effects of this system on the physical condition and modes of life, particularly of the industrial poor of a great city. If we do this it will certainly be found just as the honorary secretary of the Manchester Sanitary Association and physician to the Salford Hospital assures us is the case.* There will be observed, as he states, among this class a singular want of stamina manifesting itself either in the gait, bearing, voice, or frame. The muscular system is rarely fully developed or well strung. Few men are of that calibre from which we might expect either vigorous or healthy offspring, or arduous and sustained labor. Cases of deformity, along with actual distortion, are far from unfrequent, while minor physical defects, many of them denoting no trifling constitutional ailments, are deplorably common. The pulse, telling of the power of the heart, assures us the great central organ of the circulation is weak and flabby. The extremities are often cold in the younger people; the veins prominent and tortuous in the adult, and the elders complain of vertigo. Blanched lips and colorless cheeks are common to men as to women, while hysteria and neuralgia are to be met with under protean and abundant forms. In fine, the blood is proved to be impoverished, and the nervous system devoid of that well-balanced tension on which the easy and harmonious

* The Danger of Deterioration of Race from the too rapid increase of Great Cities. By John Edward Morgan, M.D., etc. London: Longmans.

working of the whole system so mainly depends. In the children of this class, again, the teeth are no sooner developed than they begin to decay; enlarged glands protrude from the neck; the skin looks dry and parched; the hair scanty, scrubby, or withered. If we extend our inquiries, we shall find, too, that of the number of military recruits derived from the population of our great towns, nearly four out of five fail to come up to that standard of bodily fitness which the army medical referees are instructed to insist on."—(*Lancet.*)

"*Tooth Development.*—DR. W. WALDEYER, of Breslau University, at the close of a paper in which he details his protracted investigations on this subject, gives the following particular summary of the whole. He says: The teeth of man and mammals, inasmuch as they bear enamel, begin their development with the ingrowth of the epithelium of the cavity of the mouth (Kölliker's *enamel germ*) in the maxillary blastema.

"2. The enamel germ forms a continuous layer on the margin of the jaw, along its whole length (Kölliker).

"3. At those spots in which teeth are to originate, papillary elevations of the blastema of the mucous membrane of the jaw grow toward the enamel germ (*dentine germ*, tooth-bone germ, ivory germ), then consisting of a few separate cells with distinct dark nuclei, which tilts in before it the enamel germ.

"4. The prepared tooth-origination consists of the tooth-bone germ and the enamel germ tilted in by it. The latter now has divided itself into as many individual larger masses as there are to be teeth; these separate divisions are now called *enamel organs*. Each enamel organ, as a cap, surrounds its dentine germ.

"5. The enamel organ further divides itself into three parts, the *inner epithelium* or *enamel membrane*, the *outer epithelium*, and the *enamel pulp*.

"6. The inner epithelium, the enamel membrane (Kölliker), consists of cylindrical nucleated cells, which are placed directly on the surface of the tooth-bone germ.

"7. The outer epithelium is the direct continuation of the inner epithelium to the surface of the enamel organ, turned away from the dentine germ; it, through a narrow bridge, passes over the *neck of the enamel germ* into the epithelium of the oral cavity.

"8. The enamel pulp fills up the space inclosed by the two epithelia and consists of star-like cells anastomosing together (*transformed epithelium*, Kölliker).

"9. The neck of the enamel germ, in regard to the enamel organ, at a later period is destroyed by an extension of connective tissue of the tooth-flesh between them; the tooth-foundations are thereby separated altogether from the epithelium of the oral cavity. Remains of this enamel germ-neck here and their remain as small epithelial cell-nests (*glandulæ tartaricæ*, Serres, Kölliker).

"10. The epithelium of the oral cavity, in the development of the teeth, is raised as a wall (*tooth-wall*, Kölliker) above the margin of the jaw. In the incisors it is raised out of the furrow between the lip and the margin of the jaw, and from this furrow also the enamel germ is tilted in *sideways*. In the grinders the latter extends from the edge of the jaw *straight downward;* here also the tooth-wall accordingly is developed above in the jaw.

"11. A little tooth-sac, so called, which, as a follicle, incloses the tooth-

origination, does not exist; they are rather surrounded in their alveoli by a vascular mucous tissue, which is transformed later into connective tissue, and serves as a foundation for one portion of the jaw and of the tooth-flesh as well as for the cement.

"12. The enamel has its origin in a direct calcification of the enamel cells (Schwann, Tomes).

"13. The cross streaking of the enamel prisms are, perhaps, partly produced mechanically—by the, at first, mutual superposition of the still soft prisms crossing each other.

"14. The crossings of the enamel prisms are explained by the circumstance that, while the enamel is forming, new enamel cells are constantly arising, and are, in various directions, inserted between the old ones.

"15. The enamel cells are developed from the stratum intermedium, of a cell-layer analogous to the rete Malpighii of the epidermis close under the inner and outer epithelium, lying between this and the star-shaped pulp-tissue.

"16. The already existing enamel cells extend, moreover, by direct apposition of elements of the stratum intermedium.

"17. The star-shaped enamel pulp, at a later stage, disappears; then both epithelia, the outer and inner, approach each other, the two fused strata intermedia, their common rete Malpighii in the midst.

"18. At almost the same time the spongy vascular connective tissue which surrounds the tooth-originations in the alveola drives vascular papillæ into the united epithelial layer, which, on its part, sinks down between the papillæ. (*Epithelial shoots*, Marcusen, Kölliker.)

"19. After the formation of the enamel is completed, the remains of the epithelium is transformed into a laminar epithelium, of which the cells are finally fused into a kind of homogeneous skin, while their nuclei disappear. *Enamel upper cuticle.*

"20. The cuticle of Huxley is an artificial product; it represents the uppermost (most recent), least calcified layer of the enamel.

"21. A 'membrana preformativa' as a special formation does not exist.

"22. On the upper surface of the dentine germ, by increase and enlargement of its cells, are formed the *ivory cells*, these are exactly analogous to the *osteoblasts* (Gegenbaur).

"23. The dentine formation proceeds so that the cell-substance of the ivory cells themselves is calcified; but partially, however, while some of their processes, which partly are formed before the calcification, and partly only by partial calcification, are left as soft fibrous masses (*tooth-fibres*, Tomes, Kölliker).

"24. The calcified mass of the dentine cells forms the so-called *intertubular substance* of the dentine; the cavities which receive the tooth fibres are the *tooth canaliculi*, which do not proceed into the enamel.

"25. The inner surface of the tooth canaliculus facing the tooth-fibre is covered by a kind of elastic sheath (*tooth-sheath*, E. Neumann).

"26. The dentine formation and the ossification process are completely analogous to each other.

"27. The dentine cells are recruited by new formation and increase from the cells of the dentine germ which are placed, variously, in direct connection with the already complete dentine cells.

"28. The cement consists of the transformed vascular mucous membrane of the alveoli; the process is the same as in the ossification, only that the cement is often formed by direct petrifaction of a fibrous connective tissue previously traceable of the alveolar periosteum. A special

cement germ from which the cement of the crown would be formed (Robin and Majitot) does not exist; the formation of this cement is the same as that of the cement of the root."—(*Zeitschrift für Rationelle Medicin*, series iii. vol. xxiv. pp. 209–12, and *British & Foreign Med.-Chir. Rev.*)

Sympathetic Irritation.—"It is well known that an irritation of the peripheral extremity of one branch of a nerve will sometimes excite an irritation at the periphery of another branch of the same nerve, which is distributed to another part—*e.g.* a toothache is often accompanied by pain in the ear, both pains being relieved by the introduction into the auditory canal of a little laudanum or chloroform; the earache is aggravated, however, by the application of cold to the tooth, and disappears on its extraction. Irritation of the gastric branches of the vagus by improper food will sometimes give rise in children to reflex spasm of the glottis; irritation of the pulmonary branches of the same nerve by enlarged bronchial glands to a violent convulsive cough. We know also that an impression at the peripheral extremity of a sensitive nerve may produce such a change in that part of the nervous centre from which it arises as to excite a motor or sensitive nerve implanted near to it; and that if a sensitive nerve be stimulated at its origin in the brain, a sensation is produced which is referred to its peripheral extremity. If a motor nerve be in this manner excited a reflex action results, among the numerous examples of which that of winking may be cited. The afferent nerve is in this case a branch of the superior maxillary division of the fifth cranial nerve, and the efferent, or motor nerve, is the portio dura. The pain over the brow, sometimes induced by the swallowing of ice or cold water, at others by a derangement of stomach digestion, furnishes us with an example of a reflected sensation. The sympathy between the ear and the larynx affords us another instance. The impression produced by irritation of the auditory canal, in those who are the subjects of this peculiarity, is probably conveyed by the auriculo-temporal branch of the inferior maxillary division of the fifth cranial nerve to the deep origin of its sensitive root, which is in close proximity to the deep origin of the vagus in the floor of the fourth ventricle. Here a change is in all probability effected in the gray matter, which results in the stimulation of the root of the vagus. The irritation is referred to the larynx, because the medulla oblongata is wont to receive impressions from that organ through this nerve. As a consequence, the expiratory muscles necessary for coughing are set in action to free the larynx of the *supposed* irritation. Sometimes the cough is accompanied by vomiting—an action which not only results from irritation of the peripheral extremity of the vagus, as when emetics produce it, but from an excitation of the cranial origin of this nerve. The cough from teething, which it is so important to diagnose from that of croup, bronchitis, etc., and which usually ceases as soon as the gum lancet has been judiciously employed, furnishes us with a third example of a reflected sensation. Dentists appear to be well acquainted with the fact that a continued irritation of the dental branches of the fifth cranial nerve will sometimes produce a cough at almost any age, and that in such cases the stump of a tooth is frequently the cause of this annoyance."—(Dr. C. B. Fox, *Lancet.*)

"*Local Anæsthesia.*—Dr. Richardson, at the request of the President and members of the Harveian Society, explained to the society that the effect of his ether apparatus was probably entirely due to the cold gener-

ated by the rapid evaporation of the ether. The action of cold in thus producing insensibility was due, he thought, to the fact that the force of sensation in different parts was brought down by the blood. When we touched a part more motion was produced, and consequently more sensation. He did not believe in compound nerves of sensation. When a part was frozen the blood could not supply sufficient heat to keep up the sensation of the part. Nerve force was brought down by every contraction of the heart. As a verification of this view he mentioned that local anæsthesia could be much more rapidly obtained, if, while cold was applied, the vessel leading to the part were compressed. Thus when the toe-nail is removed, pressure should be made on the anterior tibial artery, and thus we are enabled more rapidly to produce complete absence from pain. With regard to the apparatus required for operation, he generally carried about with him a three-division bottle, having three jets near each other, and all fitting together in a leathern case. By means of this apparatus the operation of Cæsarean section had been painlessly performed, and a tumor on the back, requiring an incision of seven inches, had been removed by Mr. Adams. When a part is to be frozen, it should be previously carefully and perfectly dried, otherwise a film of ice formed and obstructed anæsthesia. This was the reason of the difficulty in operations of dentists. In some cases hoar-frost is deposited on the surface of the part, but anæsthesia may be obtained even in such cases. If alcohol or chloroform were added to the ether, hoar-frost appeared. The test for the purity of the ether consisted in finding whether it would boil when poured into the palm of the hand. This could be ascertained by holding the hand near the ear and listening. One caution he would give—the use of chloroform had introduced a certain carelessness into operations, the operator would sometimes talk and observations were made, which might cause, as he had witnessed, syncope of the patient.* Now that anæsthesia was local, solemn silence should be maintained. * * * There was sometimes a little pain felt in applying the spray to the hands or forehead. He had not yet seen sloughing follow on its application. In Bright's disease blistering of the skin was produced. With regard to its use in medical cases, whenever the pain was thoroughly local, freezing would relieve it. In cases of conjunctivitis it had proved of service. He had recently made use of a styptic ether for surgical operations and found it of great service. The ether was mixed with xyloidine, or starch dissolved in nitric acid. In the case of a young gentleman of a hæmorrhagic diathesis who had nearly bled to death from the extraction of a molar tooth, he first froze the part and then plugged it by the styptic, so that the bleeding was completely stopped. * * * As to tooth-drawing, there was no difficulty in extracting the upper teeth without pain. But in the back and lower teeth there *was* difficulty, because of the saliva becoming frozen. In one case he had applied cold to the cheek, and thus caused painless extraction of the teeth."—(*Dublin Med. Press.*)

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Relative Sensibility of Skin, etc.—"At a recent meeting of the Vienna Academy of Medicine, Prof. Hebra remarked that the pain of cauterization by nitrate of silver in lupus was materially diminished by Richardson's method of local anæsthesia, but that of the galvano-caustic was exaggerated by it. With regard to the scale of sensibility of different

* On the other hand, confidence with diminution of sensibility and pain may be secured by diversion of the patient's mind with judicious conversation.—Z.

portions of the skin, he stated that the angle of the lower jaw and the regio-suprahyoidea were the most sensitive to such cauterization. Prof. Patruban referred to the remarkable discovery, hitherto unexplained, that the nervus auriculo-temporalis of the third branch of the fifth pair retained its sensibility longer than any other in the deepest chloroform-narcosis."—(*Boston Med. and Surg. Jour.*)

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"*Dental Insulator for Anæsthetic Operations.* By FRANCIS McCLEAN, Junior, Dental Surgeon to the City of Dublin Hospital, etc.—Some months since when the anæsthetic spray-producer was on its trial, it was reported to be most successful in all minor surgical operations, excepting the extraction of teeth, in which most painful one its efficiency was only doubtful. I then laid before the readers of *The Medical Press and Circular*, in its issue for March 14, 1866, the result of my experiments with it in dental operations, and I arrived at the conclusion 'that the anæsthetic effect is complete whenever the spray can be properly applied.' In its application I found a number of difficulties to contend with, but the greatest was to prevent the tongue and cheek from interfering with the ether spray when applying it to the teeth in the lower jaw. With a view to obviate this difficulty, I have contrived an instrument which can be easily used without the assistance of a third party—which will expose an uninterrupted view of the tooth to be extracted, and of the parts necessary for the spray to play on—very simple in its construction, and can be held in the mouth lightly by one hand of the operator, while his other is engaged directing the ether jet.

"The instrument, manufactured of silver, consists of two valves, curved so as to give a sufficient space round the teeth to which they may be applied for the introduction of the double jet, and hinged to each other to allow them to adapt themselves closely to the lower part of the jaw. To the inside is attached a plate for depressing the tongue, which it effects without controlling its movements or causing the unpleasant sense of sickening which the use of the spatula is subject to. To this depressing plate is attached the handle movable on a pivot so as to allow of its being drawn to one side. When the instrument is placed *in situ*, it perfectly protects the tongue and cheek from the ether, the two valves, being pressed together by the parts, fit closely to the gum covering the lower part of the alveolar process, while the tooth and its surrounding parts are seen in the centre perfectly insulated.

"The patient keeping the mouth well open so as to allow the ether to evaporate quickly, can at the same time work the hand-ball bellows as the operator may direct. The moment the parts become blanched, the surgeon dextrously withdraws all, and without delay extracts the tooth, which I have no hesitation in saying can be done painlessly in a large majority of cases, *provided you use anhydrous ether with Richardson's double spray-producer in proper working order.* Too much attention cannot be given to these requirements, for in cases in which I have seen the apparatus fail, and so fall into disrepute, the cause have been its not working properly and the impurity of the ether used. With regard to the objection of the ether entering the throat and tickling the fauces for the few seconds which the application requires, this can be avoided by protecting it with a napkin, and requiring the patient to breathe through the nose.

"This instrument, to which I have given the name Dental Insulator, I place before the profession as the result of my exertions to facilitate the

use of local anæsthesia in dental operations, not doing so, however, without fully testing its efficacy. Having done so, I feel satisfied that, by its aid, we will have more success in operating on the teeth of the lower jaw than has hitherto been experienced."—(*Dublin Med. Press.*)

"*Large Epulis originating in the Tooth Socket.*—A female, thirty years of age, was admitted to the Meath Hospital and County Dublin Infirmary, during the present month, under the care of Mr. Porter, with a large growth springing from the molar region of the right side of the lower jaw, disfiguring her appearance by the protrusion of her cheek, and interfering with mastication and articulation. About two years previously, the first molar tooth at the right side of the lower jaw became so loose that she pulled it out herself. Shortly afterward a small cherry-like tumor was observed growing from the socket; this tumor became gradually larger until it attained its present size, that of a small hen-egg. It overlaps and conceals the adjacent teeth, investing both the lingual and buccal surfaces of that portion of the lower jaw, and encroaching upon the tongue and cavity of the mouth. The superior part of the tumor has become ulcerated from frequent pressure against the opposing teeth of the upper jaw, and the injured part is the seat of pain which is not severe, and has but lately occurred. The tumor possesses the same degree of firmness and vascularity as the healthy gum, and there is no glandular enlargement. Mr. Porter drew attention to the distinction between these kind of tumors and malignant growths in the same situation, and to the resemblances which an epulis in a state of ulceration, the seat of hæmorrhage and of suppuration, presents to malignant disease, remarking upon the origin of the disease in this case from the alveolus as being less common than that from the interdental gum, as in the case operated on by him in May. The woman's health being delicate, her confinement having taken place three weeks ago, any operation for the removal of the tumor has been postponed until she is stronger, as it will be necessary, on account of the size and situation of the disease, that the cheek should be partially slit from the angle of the mouth to give room for the extirpation of the growth."—(*Dublin Med. Press.*)

"*Cystic Tumors of the Jaw.* Read to the Massachusetts Medical Society, at the Annual Meeting held in Boston in May, 1866, and communicated for the *Boston Medical and Surgical Journal.* By J. Mason Warren, M.D.—The appearance of these tumors is generally very formidable, and the practice, for the most part, when the whole substance of the bone is dilated into a mere sac, almost entirely deprived of osseous substance, has been, until very recently, to remove the portion of the jaw involved by the tumor. When the tumor has grown simply at the expense of the outer table of the bone, either of the upper or lower jaw, without involving its whole substance, it has been customary to explore the cyst and remove a portion of it, causing inflammation and obliteration of the cavity, as in the case of cysts occurring in soft parts. Dupuytren, in his collected articles on Diseases of the Bones, has attached more importance to this question than any other writer, and illustrates by cases the effect of exposing the tumor by external dissection, removing a portion of the sac, and, by applications, effecting its obliteration. Professor March, of Albany, has written a valuable paper on this subject, in the 'Transactions of the New York State Medical Society.' Professor Gross and others have suggested the idea that in large cysts, which in-

volve the whole bone, and which formerly were known under the name of 'spina ventosa,' the treatment should be the same. In one of the cases cited by the former gentleman, the extirpation of the bone was finally found necessary after this plan had been tried.

"As to the causes of these diseases, they are various. In the jaw, they probably arise, in most instances, from irritation at the roots of the teeth; in the long bones, the head of the tibia for instance, from blows.

"In 1862, I published, in the Boston Medical and Surgical Journal, a case occurring in an elderly woman of a cyst which involved the ascending portion and condyles of the jaw, and which I removed; not thinking it safe, in a person of her age, when the disorganization of the jaw seemed to be so complete, to run the risk of an experimental mode of treatment. Since that time, I have had an opportunity of trying the conservative plan of treatment in two instances, which I propose shortly to relate.

"Notwithstanding the principle which has been suggested or hinted at, for the treatment of large cystic tumors of the jaw, none of the writers on the subject have presented cases—where complete destruction of the bone has taken place, leaving nothing but a delicate cyst—which have been successfully treated by the method referred to. Dupuytren, in his work on 'Diseases of the Bones,' gives several cases treated without excision; some of them, however, unsuccessfully. M. Nélaton has also written upon the subject, referring for cases to the work of Dupuytren, and advising the puncture of the cyst and the stuffing of its cavity with lint. Mr. Erichsen says, 'when the cysts are so large that they have destroyed the integrity of the bone, or when they are associated with a large quantity of fibrous tissue, so as to constitute true fibro-cystic tumors, excision of the diseased bone must be practiced.' Mr. Stanley, in his 'Treatise on the Diseases of the Bones,' describes perfectly the affection, but does not allude to any other operation than the 'removal of the tumor and of the portion of the bone from which it has arisen.'

"In the two following cases the treatment consisted in the puncture of the sac within the mouth, evacuating its contents, and at the same time obliterating its cavity by crushing in its walls; and lastly, in keeping up, by injections, etc., a sufficient degree of irritation to favor the deposition of new bone. The comparative mildness of this mode of treatment, and the excellent character of the results, combine to award the preference for this operation over excision, or even the large external incision adopted by Dupuytren.

"*Cystic Tumor of the Lower Jaw.* CASE I.—A young woman, æt. 25, with light hair, blue eyes, and delicate skin, applied to me, in the spring of 1862, on account of a large tumor involving the whole right side of the jaw above its angle. The tumor was of a globular shape, extended back under the lobe of the ear, forward so as to encroach upon the cavity of the mouth, and upward so as to press upon and somewhat to overlap the zygoma. The external surface of the tumor was smooth and shining, slightly œdematous, and she suffered somewhat from its pressure upon the surrounding organs. It had commenced, some years before, by a swelling at the root of the wisdom tooth of the right side, and the inconvenience caused by its pressure had become so great as to lead her to take measures for its removal.

"Upon consultation, it was decided that a portion of the jaw would probably require removal, the tumor having been first exposed by an incision made inside of the mouth, to verify its character.

"The following operation was performed, under the influence of ether: An incision was made in the most prominent part of the tumor in the mouth, upon which a large quantity of glairy fluid escaped. Upon passing the finger into the opening, it was found that the whole jaw, at this point, with the articulating and coronoid processes, was expanded into a mere shell, at some parts as thin as parchment, and destitute of osseous substance. It was without solid contents. Under these circumstances, and considering the good health and youth of the patient, it was determined to make the attempt to save the jaw. A portion was therefore removed from the sac, and with the fingers the sides of the cavity were made to collapse, so as to come in contact with each other. In order to excite still further irritation, a bit of cotton cloth was forced into the interior, and the end left projecting into the mouth. A moderate degree of irritation followed, and in a day or two the pledget was removed, suppuration having commenced in the sac. The aperture was dilated from time to time by the introduction either of the finger or of a bougie, and the sac injected with tincture of iodine. In two or three weeks she left the hospital, with the tumor reduced to about half its original size. From that time until the present, she has occasionally visited me at my house, and by keeping the external opening free, and occasionally irritating the interior of the sac, a solid mass of bone has been deposited anew, and the jaw has resumed somewhat of its original shape. The sac is in the way of becoming entirely obliterated.

"In November, 1863, I again saw the patient, who came to consult me, not about herself, but about a friend. All signs of the tumor were gone, and the jaw had regained almost its natural shape; but a small aperture still existed at the site of the former opening into the mouth, from which a glairy fluid was occasionally discharged. She was quite well, and all the functions of the jaw were perfectly performed.

"Subsequently, she applied to me with a similar tumor, but of a much smaller size, which had appeared anterior to the site of the first one. It was treated in a similar manner, with a similar result.

"Case II.—May 23d, 1863, Dr. Bennett, of Uxbridge, Mass., brought me as a patient, a gentleman 56 years of age, with a large tumor on the right side of the face and parotid region. He was of a pale and yellowish color, much emaciated, and his aspect at first struck me as that of a person suffering from malignant disease. He said that, five years before, while eating, he had the sensation of something giving way in the neighborhood of the ascending ramus of the lower jaw. Shortly after, a tumor appeared in that region, which had slowly increased to its present size. Before making an examination, it was not easy to say whether the tumor was connected with the parotid gland or with the jaw. From the first commencement of the tumor to the present time, mastication, and for a good part of the time, deglutition, had been much interfered with. The tumor had been examined by many physicians of experience, and by most of them considered as a parotid tumor, and, as the patient inferred, although he was not directly told so, of a malignant character. It extended backward into the parotid region, upward upon the face, and inward so as to occupy the right half of the palate, and was covered with a highly irritable mucous membrane, somewhat œdematous, and similar to what we often see investing malignant tumors in the mouth which have made their way through from the neck. During an examination, the patient said there had been of late a slight discharge of fluid into the mouth,

and on making a careful inspection, a minute aperture was detected at the point where the last molar tooth had been removed.

"On introducing a probe at this point, a jet of serum, mixed with flakes of lymph, was projected to a considerable distance. I immediately enlarged the opening with a knife, so that I could introduce the finger. This was a matter of some difficulty, however, as the patient's jaws had been for a long time nearly closed in consequence of the disease. The finger penetrated into a large sac extending far out of reach, and on investigation it soon became evident that the whole tumor was formed by the expansion of the jaw from the development within it of an immense cyst. On withdrawing the finger, a barrier of bone was felt extending across the jaw, and behind it, under the first molar tooth, another smaller sac was discovered.

"I now decided to treat this case in a similar manner to the preceding one. An oblong piece of about an inch in length and half an inch in width was removed by scissors, from the wall of the cyst, and, with a finger of one hand in the mouth, and a finger of the other on the outside of the face, the sides of the cyst were broken down, giving way under pressure like parchment, with a crepitating noise. The projection of the tumor on the face, as well as within the mouth, became in a great measure effaced. There was a slight but unimportant effusion of blood. The patient returned home under the charge of his physician, with the intention of pursuing pretty much the same course as was adopted in the former instance. On account of his age, and the debility caused by the want of proper nourishment, and owing to the difficulty of mastication, he was ordered tonics and a nutritious diet.

"About four weeks later, I saw him again. Everything had gone on well. The tumor was not more than a fourth as large as formerly, and bone had begun to be deposited in the walls of the sac. His health was wonderfully improved, and his complexion had assumed a healthy hue.

"Dec. 8th, 1863.—I saw him for the third time, so altered for the better as scarcely to be recognized as the same person. The jaw externally had resumed its natural shape, and, on examination with the finger, its distinctive anatomical marks and processes could be felt. On the inside, where the incision had been made, a deep sulcus was observed, lined with mucous membrane, into which a probe could be passed into the ascending ramus. There was no discharge to be detected, and the power of mastication was as good as ever. The only trouble he experienced was from the lodgment of food in this cavity.

"Three months later, he was seen with the jaw in a perfectly healthy condition, having all its functions, and the only change from the normal state was perhaps a somewhat more solid and thickened condition than natural, with a sulcus existing at the back part, where the tumor had originated.

"In 1866 he made me a visit for the purpose of showing the complete success of the operation.

"*Cystic Tumor of the Upper Jaw.* Case III.—A young lady, æt. 16, of English parentage, was brought to me in May, 1865, on account of a tumor which had been developing for the last three years, in the alveolus of the right upper jaw, just above the canine and bicuspid teeth. Three years before, the nerve of the canine tooth had been destroyed by arsenic, and the carious cavity filled with gold, the first bicuspid also being filled at the same time. Irritation soon commenced at the roots of these teeth,

and gradually, and almost imperceptibly, a swelling appeared there. A month before she came to me, this tumor opened at its most dependent part, discharging a glairy fluid, which continued to exude until I saw the case.

"The aperture admitted a small probe, which penetrated into a deep, smooth cavity. With the finger, the tumor from below appeared firm; but, when pressed upon under the gum, a degree of elasticity was distinguished.

"I informed the parents of the young lady that the disease was a cystic tumor of the bone, and advised an operation. This was assented to. The patient was etherized, and a cut made into the tumor. The mucous membrane was then dissected up from its surface, so as to expose so much of the bony sac as would admit of a free opening being made into it, and the portion of bone was removed with scissors. The finger could now be passed freely into the cavity, which was quite smooth and entirely lined with membrane; it was not penetrated by the roots of any of the adjacent teeth. The cavity was stuffed with lint, in order to excite inflammatory action, for the purpose of obliterating the sac.

"The operation had all the effect that could have been desired. In the course of a couple of months, granulations filled up the cavity, entirely obliterating it. She was completely relieved of the disease.

"One or two other cases of cysts in the upper jaw I have treated in the same way, with a similar result."

"*The Subcutaneous Method.*—M. GUERIN, in the memoir the propositions of which we presented last week, did not act very wisely to refer so directly to M. Velpeau, for he aroused the old lion, who quickly showed that his objections were not mere prejudices, but founded on reasoning of which he was well able to maintain the soundness. While cheerfully admitting M. Guérin's great merit in so perseveringly following out the practice of the subcutaneous method, he cannot, in face of the facts placed on record by Delpech, Stromeyer, and Bouvier, admit that he is really its originator, nor can he agree with him in the exclusiveness of its advantages, and in the interpretation of its phenomena. Indeed, he is in a position to deny one of the leading propositions, viz., that subcutaneous wounds never suppurate, unless through the unskillfulness of the surgeon; for he has met with cases which have been under M. Guérin's own care and still have suppurated. And even without these cases, do we not often meet with suppuration after dislocations without breach of the skin, and in which the air has been much more carefully excluded than can be the case in any subcutaneous operation?

"'In fine, subcutaneous incisions do in fact rarely give rise to suppuration; but this is a fact admitted by everybody, and which has been announced before M. Guérin, but in a far less absolute manner than that which he is seeking to establish. I cannot admit that he has resolved the question by the simple statement:—"With air suppuration; without air no suppuration—*i.e.* immediate organization." M. Guérin is much attached to the mode of arguing based upon philosophical induction, and he employs it by appropriating to himself discoveries which he only shares with others. Let me be allowed a comparison. Suppose that in a field open to all and cultivated by all, each bringing his labor and his industry, and receiving his share of the product, some one raises a palisade, and declares "No one shall enter here nor labor here without my

permission." This field represents the subcutaneous method, which M. Guérin has thus seized hold of. Now what I want is that every one who has worked at this method should have his share of the merit. That belonging to M. Guérin I do admit is a large one; for it is he who has generalized the method, and no one has been engaged with it and employed it more than he has; but he makes use of language which may impose on some surgeons, and which I think I ought to correct. I have a great esteem for him; I pay homage to his talent, and I applaud his ardor in scientific research—an ardor which the progress of age has not diminished; but he is obstinate, as I have found out during these thirty years. On my side, too, there is no deficiency of perseverance, and whenever I find him reproducing what I have already combated, I cannot resist the impulse to ascend this tribune.'"—(*Med. Times and Gaz.*)

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"*Chloride of Sodium in the Treatment of Wounds.*—This is one of the most important discoveries of the present day for inducing the speedy cicatrization of suppurating wounds and for obviating the dangers that sometimes result. A great many agents have been employed for this purpose, as coal-tar, phenic acid, camphorated alcohol, chlorate of potassa, and other compounds of chlorine, and latterly the sulphites. Among these different agents, none are more useful as disinfectants than the compounds of chlorine: but, strange to say, the chloride of sodium, which is the most common, and is always at hand, is rarely used by the profession. It is not, however, that experience has failed to testify to its worth; for many very able and interesting articles have been written on its use in the treatment of wounds, and submitted to the profession. Latterly Dr. V. Dervandre has published an article on the value of the chloride of sodium in the treatment of wounds, the more valuable, adds this author, because it can be always procured. The first effect of the chloride of sodium on a wound which is fetid, is to induce the immediate disappearance of the bad odor. Another immediate phenomenon observed is the pinkish hue which it gives the decomposed sanguineous blackish liquid which covers the wound. At the same time, there is experienced a sensation of cold and of pricking in the wound which may even become slightly painful. The suppuration diminishes rapidly in quantity, and if sanious, it becomes healthy in a few days. The wound granulates and cicatrizes rapidly. The change evidenced in wounds by the chloride of sodium has a happy effect on the system. The appetite improves, and the patients acquire strength. In support of the value of a solution of this salt, Dr. Dervandre reports 400 cases of wounds thus treated. In one case only was there pyæmia. There was neither erysipelas, nor tetanus, nor hospital gangrene present in any of his cases, though the hygienic condition of the hospital under his care was bad. The solutions used by Dr. Dervandre are not of the same strength. At first he uses a solution of about two drachms to two pints of water. In a few days afterward he resorts to concentrated solution. These solutions are injected in fistulous tracts or on the surface according to the nature of the wounds."—(*Union Medicale* and *Richmond Med. Journ.*)

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Potent Disinfectant.—The *Dublin Med. Press* states that Dr. Dewar, of Kirkcaldy, has discovered that "for the disinfection of inanimate material the addition of a little nitre to sulphur, and the combination of these fumes with the steam of boiling water, improvises a disinfectant at

once the most powerful, most searching, and most efficacious which can be obtained, utterly destructive at once of any latent contagion, and of every form of insect life."

"*Collodion.* By John P. Maynard, M.D.—Take two parts of sulph. acid, sp. gr. 1·850, and one part nitric acid, sp. gr. 1·450. Mix them—allow the temperature to fall to about 100 Fahrenheit. Add to this, raw cotton, to point of saturation. Let it soak about one to two hours. Pour off the acids. Wash the cotton till litmus paper shows all acidity removed. Dry thoroughly. The cotton will now be found to be converted into a gum, completely soluble in ether of about ·750 sp. gr., or in pure ether 3 parts and alcohol 95 per cent. 1 part. About two ounces of cotton thus prepared will make about one pint of collodion of proper consistency for surgical purposes. For photographic objects, a less amount will be sufficient. The conditions for success by this formula are simply precision in the details and careful manipulation, which a little experience will perfect."—(*Boston Med. and Surg. Journ.*)

"*On a Method of Dry Mounting.* By James Smith, Esq., F.L.S.—The object of this paper, read before the Microscopical Society of London, was to show how to prepare cells for mounting dry objects, so as to be ready for use at any time, and capable of an immediate application to glass slides.

"The author proposes to take a piece of card-board of six or more inches square, according to the number of cells required, and rule a series of perpendicular and parallel lines five-eighths of an inch apart, so as to divide it into squares. The centre of each square is then to be perforated with a one-half inch punch, and both surfaces of the card-board covered with a cement formed of shellac or marine glue dissolved in naphtha; one to three coatings of this cement being usually sufficient, care being taken that one is perfectly dry before the next is applied. The cells being thus prepared, they can be cut off, and by the application of heat and slight pressure are easily attached to a glass slide. The object being placed in the cell, a thin glass cover may be heated and so fixed, or this and the edges of the cell itself covered with a coating of cement. The author concluded by stating that leather or thin wood might be readily converted into cells in the manner described, but that for all ordinary purposes, those prepared of card-board would be found quite efficient."—(*Quarterly Journal of Microscopical Science.*)

Action of Acids upon Metals and Alloys. In a paper lately presented to the Chemical Society of London, Dr. F. Crace Calvert offered some interesting observations by Mr. Johnson and himself on this subject: "The authors have examined the actions of the common mineral acids, especially nitric, sulphuric, and hydrochloric acids, upon the metals zinc, tin, and copper, and upon the most important of their alloys, particularly brass and bronze. The results obtained are of great scientific interest, besides having a practical value in connection with the applications of these metals in the arts. The most important conclusions established by the authors may be thus stated: 1st. The extent of action of any acid upon an alloy cannot always be predicted from the known effects of the same acid upon the individual metals. 2d. A variation in the proportion of the constituent metals, no greater even than ten per

cent., will sometimes entirely change the character of an alloy so far as regards its corrosion by or solubility in acids. 3d. The influence of water in modifying the action of acids upon metals and alloys is in nearly all cases very considerable."—(*Chemical News.*)

"*A Remarkable Solvent.*—It is now discovered, it appears, that if a piece of copper be dissolved in ammonia, a solvent will be obtained, not only for lignine, the most important principle of all woody fibre—such as cotton, flax, paper, etc.—but also for substances derived from the animal kingdom, such as wool and silk. By the solution of any of these an excellent cement and water-proofer is said to be formed; and, what is equally important, if cotton fabrics be saturated with the solution of wool, they will be enabled to take the dyes—such as the lac dye and cochineal hitherto suited to woolen goods only. Hydriodide of ammonia, we may also observe, was not long since discovered to be an equally remarkable solvent of the most refractory, or, at least, insoluble mineral substances. Now it is an interesting circumstance that ammonia, according to Van Helmont, and other old chemists and alchemists, was one of the requisite materials in the formation of the 'alkahest,' or 'universal solvent,' of the ancient sages. In the cupride of ammonia (if we may so call the solvent here spoken of), we seem to have the solvent of silk which we lately desiderated in our remarks on the insulation of submarine telegraph wire."—(*Journal of Applied Chemistry.*)

"*Precipitation of Metals from their Saline Solutions by Means of Magnesium.*—M. ROUSSIN has just published a paper on the action of magnesium on metallic solutions, and on its application to toxicological researches, which shows that magnesium is particularly well adapted for the precipitation of other metals from solutions of their salts. It is a general principle that one metal will precipitate from a saline solution any other which is less readily oxidable than itself, but some metals, by no means among the most oxidable known, had nevertheless, when M. Roussin began his researches on this subject, resisted all attempts to precipitate them by the contact of another metal with their saline solutions. With two exceptions, however, all the metals alluded to are precipitated in the metallic state by magnesium, the two exceptions being chromium and manganese, which appear to be precipitated as oxides. Among the metals which M. Roussin has precipitated in the metallic state, by means of magnesium, from slightly-acidulated solutions of their salts, are gold, silver, platinum, bismuth, tin, mercury, copper, lead, cadmium, thallium, iron, zinc, cobalt, and nickel. The precipitated metals, when washed from the saline liquid and then dried and compressed, possess a very remarkable degree of brilliancy. Iron, cobalt, and nickel, so precipitated, are highly magnetic; zinc takes the form of a large spongy mass, which the least compression renders brilliant. Magnesium does not precipitate aluminum at all, and chromium and manganese, as already mentioned, it precipitates as oxides. It does not precipitate arsenic or antimony, though it decomposes their salts, the arsenic or antimony flying off in combination with hydrogen. M. Roussin shows that great advantages result from the substitution of magnesium for the metals ordinarily employed in toxicological researches for the detection of these and other metallic poisons; but into that part of his subject it would be beyond our province to follow him. His only further statement respecting magne-

sium calling for mention here is one relating to its use as a voltaic element. 'The foregoing qualities,' he says, 'encouraged the hope that a substitution of magnesium for zinc in ordinary piles would offer a great electro-motive force, and experiment confirmed this theoretical inference. A small plate of magnesium, 0·1 grain in weight, placed beside a plate of copper in a small tube of glass of six centimeters cube, filled with acidulated copper, produced in less than ten minutes an electro-magnetic appearance, and illuminated a Geisler's tube ten centimeters long. If magnesium should ever become cheap, this would decidedly be the best way of producing electricity.'

"In a note to his paper, M. Roussin states that he has observed that a sodium amalgam, shaken up with an acidulous solution of a salt of chromium or of a salt of manganese, changes to an amalgam of chromium or of manganese, as the case may be, and that an amalgam of either of these metals, obtained in the manner indicated, when distilled in a current of hydrogen, after having been first carefully washed in acidulated water, leaves the pure metal in the form of a pulverulent sponge. The amalgam of manganese, he adds, is opalescent and crystalline; that of chromium more fluid, and less variable at ordinary temperatures. When the latter is heated in a small porcelain capsule in the air, as the mercury flies off in vapor it carries off mechanically with it particles of chromium, which take fire, producing a singular scintillation, which is best observed in a darkened room. At length the chromium remaining in the capsule suddenly becomes incandescent, and burns to oxide."—(*Mechanics' Magazine* and *Scientific American.*)

Silicates.—"M. Artus proposes a method of preparation by which the process of silication is much favored; by which, it is said, a mortar may be prepared which becomes as hard as cement, does not crack in setting, and may even be used as a hydraulic cement under water. His process is the following: Take good slaked lime, and mix it with the utmost care with sand finely sifted. Mix the sand thus prepared with finely powdered quicklime, and stir the mixture thoroughly. During the process the mass heats, and may then be employed as mortar. Of course the mixture must be made just as it is to be used.

"One part of good slaked lime was mixed with three parts of sand, and to this was added three-fourths of its weight of finely powdered quicklime. The mortar thus made was used in a foundation wall, and in four days had become so hard that a piece of sharp iron would not attack it. In two months it had become as hard as the stones of the wall." (*Ann. du Genie Civil*, *Zeitung des Ver. Deutsch*, *Eisenbahn-Verwalt* and *Franklin Ins. Journ.*)

Insoluble Silicate.—"M. Ch. Guerin called the attention of the French Academy to a new method of obtaining, by a cold process, a silicate completely insoluble, which can be applied either as an external coating, as in the case of glass or iron, or made to penetrate through the interior of the substance, as for the preservation of wood and other vegetable matters. The process is very simple: a thin coating of slaked lime made into a paste with water, or whitewash, is laid on the object to be silicatized, and when this has been allowed to dry, silicate of potash is applied over the coating; the effect, it is asserted, being that all the portions touched by the solution of potash become completely insoluble, and of very great

adherence. In order to obtain an insoluble silicate in the interior of a substance, all that is necessary is to impregnate it by immersing it in whitewash, or lime-water, and when it is dry to steep it in a solution of the silicate of potash.

"By this means it is proposed to prevent the decomposition of vegetable substances by petrifying them; also to protect porous building stones and brick against air and damp; iron, by a coating of paper, pulp or other finely-divided woody matter mixed with slaked lime.

"Again, letters, characters, or any other device can be traced with the silicate on any surface spread with lime, and those portions touched by the silicate will alone adhere and become insoluble. Or, if they be traced with a solution of gum arabic, and the whole be washed over with the silicate, the parts protected by the gum can be washed off, the rest remaining in relief, as the letters, etc. do in the first place.

"The process seems to be substantially the same as the English process, known as Ransome's."—(*Scientific American.*)

"*Water-proof Packing Paper.*—The following is a German recipe: Dissolve 680·4 grammes (about 1·82 lb.) of white soap in a quart of water. In another quart of water dissolve 1·82 oz., troy, of gum arabic, and 5·5 ozs. glue. Mix the two solutions, warm them, and soak the paper in the liquid. Pass it between rollers, or simply hang it up to drip, and then only at a gentle temperature."—(*Jour. Franklin Inst.*)

"*On New Solvents of Gold.*—M. Nicklès presented to the Academy of Sciences a second note on this subject, in which he showed that iodine under pressure, or even under the influence of light, will dissolve gold-leaf. The sesqui-iodide and sesqui-bromide of iron also act as solvents."—(*Chem. News.*)

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These are all first-class journals, edited by well-known members of the profession, and will doubtless secure a large circulation, more especially as, with the exception of the *Record*, they have already an established reputation from former publication, being revived after a temporary suspension. They are welcome to our exchange list.

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ORIGINAL COMMUNICATIONS.

THE INTERGLOBULAR SPACES IN DENTINE.

An Oral Communication to the American Dental Association, at the Sixth Annual Meeting, held in Boston, August 1, 1866.

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Mr. President and Gentlemen:—Your attention is desired during a brief period, for the purpose of bringing under your notice a subject which is not only interesting when viewed from a scientific stand-point, but also of decided importance on account of its practical bearings; I allude to the *interglobular spaces in dentine.* Although long familiar with their existence in that tissue through the researches of OWEN, TOMES, CZERMAK, and KÖLLIKER, it is only within the past few months that I can claim to have given to them that careful consideration which they so justly merit. Some investigations which I have recently prosecuted in this direction were prompted by a desire to become more familiar with the subject, and as the microscopical examinations instituted by me and the conclusions arrived at are fresh in my memory, it is possible that their presentation may be of service to those who have paid no attention to the subject, and particularly to some before me who are laboring under erroneous impressions with respect to the exact character and position of these spaces.

To the best of my knowledge, no American observer has as yet placed on record any evidence of a careful examination of these spaces. In an oral address, which I had the honor to deliver last fall, in NEW LONDON, by invitation of the CONNECTICUT STATE DENTAL ASSOCIATION, on the "MICROSCOPY OF THE DENTAL TISSUES," the attention of those present was directed in a very brief manner to the *interglobular spaces;* subsequently, when publishing that address in the DENTAL COSMOS, an illustration from the American edition of "KÖLLIKER'S MICROSCOPICAL ANATOMY" was used, with the view of making the general appearance and position of

these spaces more easy of comprehension on the part of readers. That engraving has been very decidedly objected to, by one who claims to have some knowledge of histology and in the use of the microscope, as erroneous, and with the assertion that the appearances there presented are either due to the presence of air bubbles formed in mounting the section in Canada balsam, or to a mistake on the part of the engraver. My response to this is, that I would not think of charging the merest tyro in the use of the microscope with being so easily beguiled, let alone such a careful and accurate observer as KÖLLIKER, and that any important errors on the part of the engraver would have been noticed by that author and promptly corrected by him while the work was passing through the press.

Up to the time when these objections were brought to my notice, notwithstanding the fact of having prepared a large number of sections of teeth and bone, and examined a number prepared by others under the microscope, I had not been fortunate enough to have seen a specimen in which these interglobular spaces were present; determining, however, to thoroughly investigate the subject, I made a number of sections of teeth which had been recently extracted, and in one, from a first permanent inferior molar, was fortunate enough to find the object of my search. The evidence of this is before you in one of two large and excellent diagrams, by my friend, MR. PETIT, an artist of PHILADELPHIA; the first of these presents a faithful portraiture of a portion of dentine with the *interglobular spaces*, the other showing the appearance of a section of bone with the *lacunæ* and *canaliculi* observable in that tissue; as I have with me the sections from which these drawings were made, along with a number of others of the teeth of man and animals, it would afford me much pleasure to show the preparations to those who may desire a view of them under the microscope.

With these preliminary remarks, as it is foreign to my purpose to enter into a detailed consideration of the dental tissues at this time, it will suffice to state in a general way that human dentine is composed of an immense number of microscopical tubes, the *dentinal tubuli*, and a *matrix*, or *intertubular tissue*, which presents a homogeneous appearance under a lower power, but when highly magnified is found to be made up of minute granules united closely together. The *tubuli*, commencing by open mouths on the walls of the pulp cavity, may be seen passing in a radiated and a slightly wavy manner toward the periphery of the dentine, where they terminate in the intergranular spaces of TOMES or pass on into the enamel or cementum. In their course, they divide dichotomously and give off small branches from their sides which inosculate with each other. Any one who has the slightest familiarity with the microscope is well aware that the calibre of the tubes decreases in size, when passing from the openings on the walls of the pulp cavity to their term-

inations at the periphery of the dentine; this is due to the fact that as calcification of the structure progresses from without inward, the portion first formed necessarily contains the largest proportion of inorganic matter, owing to a law in the economy that tissues increase in density with age; this is markedly illustrated in the entire obliteration of the *dentinal tubuli* by calcareous depositions within their parietes as frequently presented in the teeth of old persons. In the coronal dentine, a number of faint lines are often found passing in an arched manner from one side of the section to the other, and at right angles with the dentinal tubuli; these are named, after their discoverer, the *contour lines or markings* of Owen. They are not confined exclusively to the crown but may be frequently observed in the roots.

In teeth perfectly formed, the appearances thus hastily described as characteristic of human dentine are invariably presented. In addition to this, the peculiar spaces already referred to as *interglobular spaces*, are sometimes observable in the neighborhood of the enamel (as in the section from which this drawing was made (see Fig. 1); *but they are by no means invariably confined to that locality*, for in some specimens they are *scattered in great profusion throughout the coronal dentine*,* and in other instances they are found in the roots, particularly of deciduous teeth. These spaces do not present a globular or spherical shape, but on the contrary are very irregular in their form, and, although sometimes quite small, are more frequently long and wide, and include a number of tubuli; the name applied to them therefore would seem to be a misnomer; on examining the boundaries of the spaces, however, it will be observed that they have a notched appearance, and are made up apparently of a number of sections of globules; the propriety of the appellation thus becomes quite evident. The *tubuli* do not generally stop at the boundaries of the inter-

Fig. 1.

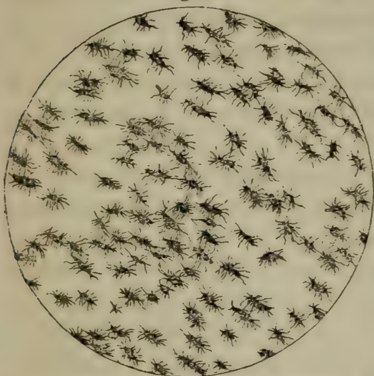
Section of Dentine with *interglobular spaces*.†

* This is markedly the case in a specimen prepared by Burgogne and Alliot, of Paris, which my friend, Dr. W. S. Bowdoin, of Salem, Mass., placed in my hands the day on which this communication was made to the Association. Having described the appearance of my preparation to him the evening before, he said that some microscopical sections imported by him from France had just been received, and he would like me to examine them. The one referred to was among these, and is a very valuable specimen, particularly in illustration of these spaces.

† The illustrations accompanying this communication are from the specimens prepared by me.

globular spaces or turn so as to pass along their sides, but they can be readily seen passing directly across them. I direct attention in particular to this fact, as it has been positively asserted that the tubuli never pass through these spaces. They are not as well defined there, it is true, as in perfect dentine, but this is easily accounted for when the exact character of these spaces is fully understood.

Fig. 2.



Section of Bone with *lacunæ* and *canaliculi*.

With a view to this, we will push our inquiries in that direction. In the first place, it has been inferred by some persons that the *interglobular spaces* are *cavities* like the *lacunæ* of bone, but the fallacy of this view becomes readily apparent on examining this drawing of a section of bone (see Fig. 2) and comparing it with the other. In it will be observed a large number of dark lenticular shaped spaces, with several irregular lines passing from each of them, scattered in great profusion over the entire field, and bearing no resemblance to the *interglobular spaces*, but, on the contrary, not unlike spiders in their shape; PURKINJE, who first observed these, regarded them as *bodies*, and he therefore named them *corpuscles*, and for a long time they were called the *corpuscles of Purkinje*. It was eventually found, however, that they are cavities occupied by the *liquor sanguinis* of the blood in life,* and that the apparent lines passing off from them are *canaliculi* or canals which inosculate with each other, and serve to carry the nutrient fluid to every part of the tissue. In microscopical specimens of bone the *lacunæ* and *canaliculi* are either occupied by air or Canada balsam, which, by transmitted light, gives to them a black, solid appearance, and it was this that led PURKINJE astray. Now, in place of the *interglobular spaces* being *cavities* filled with liquor sanguinis during life, they are occupied by a *cartilaginous structure analogous to the organic basis in which* dentine is formed, but which unlike that, owing to some defect in the assimilative process, has failed to *undergo calcification.* The tubes running through them are not as well defined as in dentine, owing to the absence of the calcareous matter which in the latter brings out the parietes of the *dentinal tubuli* in a sharp, well-defined manner. The presence of these tubes, however, in the *interglobular spaces*, in a section from a first permanent molar *recently* extracted, can be made readily apparent to those

* DR. LIONEL S. BEALE, in his work on THE STRUCTURE AND GROWTH OF THE TISSUES, says that the *lacunæ* are occupied during life by a soft substance which he calls germinal matter.

who will take the trouble to prepare and carefully examine such a specimen. The cartilaginous structure occupying these spaces, however, eventually dries up, and a section taken from a tooth some time after removal from the mouth would have actual *cavities* in it, which, when viewed under the microscope by transmitted light, would present a black appearance like the *lacunæ* of bone and cementum. This without doubt was the case in the specimens examined by that accurate and indefatigable observer, MR. TOMES, whose investigations with the microscope have done more than any one else to establish clear and accurate views of the minute structure of the human teeth, and whose observations have been so highly and justly prized by the scientific world that they are quoted as reliable authority in the works of most eminent anatomists and physiologists of the present day. The illustrations of the specimens referred to are to be found in his DENTAL PHYSIOLOGY AND SURGERY, published several years ago, in which he directs attention to peculiar-shaped cavities, which he observed as quite numerous in carious teeth lost early in life, particularly the first permanent molars. As he makes no reference in that work to the appearance of the *interglobular spaces*, with the cartilaginous substance present in them, it is probable that they escaped his notice up to that time, from the fact of having made his sections from teeth some time after they had been extracted, in place of those recently removed, and in which the cartilaginous substance had dried up, and left actual cavities, as he correctly regarded them.

In conclusion, as evidence of the practical bearings of these investigations, it may be well to direct attention to the fact that the existence of these spaces in teeth which have completed their growth must be regarded as an *abnormal condition*, *predisposing* such teeth to decay, and that when either by mechanical action, as by a fall or blow, or by the penetration of external caries, such spaces are reached, the *disease here would run riot*, hence the importance of care on the part of patient and operator to have the most minute external cavities filled, for though reached only through a microscopical opening, the result would be the same; while, if protected from the action of external influences, or the *exciting causes of decay*, this *predisposition* might remain dormant for a lifetime, as is sometimes the case with disease in other organs of the body.

These spaces, however, cannot be looked upon always as *abnormal*, as for instance when existing in young and growing teeth, the arrest of calcification may be remedied subsequently by the assimilative process, as the soft bones of children eventually become strong and hard by the deposition of a due proportion of inorganic matter. It is reasonable to infer that the obliteration of the interglobular spaces in growing teeth assists in giving to dentine the peculiar markings named *contour lines of* OWEN. The spaces becoming occupied by calcareous matter, their boundaries

form the contour lines, and remain as permanent evidence of the former existence of the spaces. In addition to this, the primary curvature of the dentinal tubuli contributes toward that appearance.

THE TUMORS OF THE MOUTH.

BY JAS. E. GARRETSON, M.D.

(Concluded from page 21.)

Epithelioma. In connection with the carcinomatous tumors of the mouth, it may not be out of place to refer to the affection not uncommon in the oral cavity known as Epithelioma. This is a disease commencing as a superficial ulceration either upon the gums or mucous membrane of the cheek, and implicating by extension the underlying osseous structure. When first observed, the ulcer may not be larger than two or three lines, yet even so small, may be distinguished by the sore being ragged and irregular. If seated upon the gum, examination with a delicate and pointed probe will reveal caries of the bone already in progress. When a diagnosis is doubtful, a few days of ordinary treatment will discover by its uselessness the intractable nature of the trouble, and set at rest any doubts.

Epithelioma as situated upon the lower lip is familiar to every one; here seems to be its favorite seat. Commencing as a slight fissure, it runs on to the speedy destruction of the patient, involving in a very short time the whole lip and surrounding parts, or, as in less malignant cases, circumscribes itself in the form of an indurated mass, remaining for a long time, gathering force, as it were, for a final onslaught.

Epithelioma is cancer, but it differs from medullary, as fatality is concerned, in seeming to have primarily but a local signification—at least so it seems to me: left to itself, it will certainly destroy the life of one affected with it; taken in time, I am confident it may be cured. Let me qualify, however: safety through early operation may exist only in the less marked form of the disease. That I have cured Epithelioma by operations, I have surviving patients to show. That they have died after operations quite as carefully and judiciously performed, the grave, I am sorry to say, holds examples from me.

Commencing in the skin, Epithelioma is apt to present itself in the warty or indurated form. On clean mucous membrane, as an ulcer, situated upon the lip or anus, having thereby associations with both skin and mucous membrane, it may present itself in either form, or even pedunculated. When indurated, the virus of the disease seems circumscribed; when ulcerated, it appears to be more or less infiltrated through the adjoining tissues. This relationship of the virus in the two conditions would seem to be proven by the relative success of operations performed upon them; the indurated, particularly the warty, being always the most amenable to treatment.

The relative frequency of Epithelioma situated inside the vestibule compared with that upon the lip, its favorite seat, is about as three to twelve. The relative danger of positions may be greatly reversed. Situated within the mouth, operative interference cannot be practiced at too early a period; in other situations, circumstances may excuse delays. Operations, to promise any hopes of success, must be thorough; it is not enough to remove the apparent disease, and the more of neighboring parts embraced in the incisions the better. Complete excision, when it can safely be practiced, is always the preferable treatment.

Two cases, directly opposite in character and result, will serve as instructive illustrations.

Mr. N., carpenter by occupation, a patient of Dr. Charles Townsend, was sent me by that gentleman, laboring under an indurated tumefaction involving a full half of the inferior lip: the tumor was semi-bluish, slightly lobulated and painful, had existed for over a year, was gradually enlarging and softening. The diagnosis of Epithelioma but verified the opinion of several other gentlemen who from time to time had examined it. Recommended the removal of the whole lip, which was concurred in by the patient. On a Saturday afternoon—I have not the date by me—performed the operation, being assisted by one of the students of the Philadelphia Dental College. The gap, which was made in the ordinary V shape, great as it was, being carried from either angle of the mouth to the symphysis menti, was filled up without any considerable effort by forcing the cheeks toward the mesial line, retaining them in position by an extemporized Dewar's compressor, and approximating the edges of the wound with the hare-lip pin and suture. The wound united happily by first intention throughout, and although at first the stretched tissues bound the lower jaw so closely as almost to prevent the patient opening the mouth, yet at this date, and indeed in three months after the operation, so completely had the parts accommodated themselves to the new condition of things that one would almost fail to detect that the natural parts had ever been interfered with. The success of the treatment has been all that could be desired; nearly three years have passed, and there is not the slightest evidence of a return of the trouble.

Case II.—*Epithelioma of Gum.*—M. G., aged about 21, farmer by occupation, was sent to me about two years back by Dr. Edward Townsend, whose dental patient he was. Dr. T., while treating a bicuspid tooth, remarked at the neck a slight ulceration, but which appearing of little consequence, scarcely at the time commanded more than a passing thought. Attempting, however, at a later period its cure, its obstinacy in yielding excited his suspicions, and being unwilling to assume the trouble of the case he directed the patient to my care. Examination made on first meeting the patient revealed a small ulcer on the left superior gum between the bicuspid teeth, in size about half as large as the

silver three-cent piece, jagged, covered with a whitish gummy secretion, and apparently superficial. The passage of a sharp probe through the centre of the ulcer revealed the characteristic carious, softened, and periosteally denuded bone. Satisfied in my own mind of the character of the ulceration, yet unwilling while there might be an unrefuted doubt, however slight, to depress the patient by informing him of the nature of his disease, I placed him under ordinary treatment for a period of two weeks, at the end of which time, finding my experience agree with Dr. Townsend, I laid before him his condition, advising an immediate resection of the affected and adjoining parts. Unwilling to submit, the patient desired consultation, and in turn the advice of every prominent surgeon in the city was obtained. Opinions differing, he, by my advice, submitted himself to various proposed remedies at several of their various hands, being treated two weeks by one gentleman, eight weeks by a second, and nine by a third, the disease progressing, but slowly, all these weeks. At the end of this time I again proposed and insisted upon an operation, informing the patient of the necessarily increased magnitude of the portion of bone and soft parts to be removed; still refusing, I declined to take further responsibility in the case. The patient making me a visit at a later period, I found the ulceration involving the Stenonian duct, and extending from the symphyses to the tuberosity of the bone. At this visit I informed him of the utter hopelessness of any operation for his relief, the disease being too extensive. From this to the time of his death, which happened in a few months, he was in the hands of different advertising impostors, and of the treatment pursued I know, and desire to know, nothing. Whether or not an early operation would have saved this patient from his early death I may not of a certainty say, but from a reasonable experience in the direction I may assert that without the performance of such proposed operation he had no possible chance.

Case III.—Col. W., merchant. Epithelioma involving, when first seen by me, lip, tongue, and cheeks—case hopeless. The disease in this patient began as a minute tubercule just over the genial bodies of the inferior maxilla; thought little about it, only received attention when found ulcerating, such attention, from misappreciation of its character, consisting in the too common application of caustics. Aggravated by such treatment, the ulceration commenced rapidly to spread, defying, when too late understood, every means employed for its arrest. Shortly after coming under my care, the lip fell off in mass, the root of the tongue indurated to such an extent as to interfere with both respiration and deglutition, and the patient, a fine robust man, died from prostration.

It must be clearly seen that whatever chance existed for this patient, it lay not in exciting and aggravating by caustics, but in the complete removal of the primary tubercule with all the immediately adjacent tissues. That error, if error there be, shall be on the safe side, I make it a rule

always to cut away, with a large margin, such tubercules: if they are benign, little harm has been done; if they are malignant, the free removal has perhaps saved a life.

Epithelioma when involving only a part of the tongue, and when markedly circumscribed, may be operated on with a warrantable degree of success; it is better in these cases, particularly if the induration is at all extensive, to amputate all that portion of the organ in mass associated with the disease; for this purpose no better instrument can be employed than the ecraseur of Chassaignac; no hæmorrhage attends the operation, and if the system has been properly prepared, the subsequent inflammation is not of any considerable importance. When, however, not only the tongue but neighboring parts are involved, any operation promises very little,—one tumor may be managed, two seldom or never.

With these remarks on this unfortunately too common affection, I close the consideration of this department of oral surgery. If what I have written shall serve the purpose of attracting to this noble field of labor more of the educated and able men now yearly entering on the duties of the profession, I shall feel myself well repaid for any labor the preparation of the papers may have cost me. Oral surgery invites with peculiar fitness the present dental surgeon; it is true, the scope of his education and observations must be increased, he must comprehend all the great principles, as well the practice of general surgery, but this advance implies only greater attention to the advantages which surround him during his collegiate period. He must dissect more, must be a close attendant on hospital and other clinics, must manipulate with his own hands and brain through all the minutia of cadaver practice. This is all that is needed; every medical student does this, and doing it, finds time for study in other directions quite as difficult as anything demanded by his college of the dental student. Let the young men coming to the various colleges this winter determine that they will take back with them, not only an ability to save teeth, but that knowledge which shall open to them a field of labor than which no man can work in a worthier or more useful one.

MICROSCOPY OF THE TEETH.

BY S. P. CUTLER, M.D., D.D.S., HOLLY SPRINGS, MISS.

I do not propose giving anything particularly new in the anatomical structure or organism of the dental structures of the human teeth. The department of microscopic histology of the teeth has been extensively investigated by Retzius, Nasmyth, Owen, Tomes, Kölliker, Prof. Leidy, and many other able microscopists, with superior instruments, which leaves but little if anything to be added that is not already known, though I do not regard the subject as exhausted. It is like the golden sands that have been carefully washed over and over again; still

some shining particles may be discovered which had hitherto escaped observation. I propose giving the results of my own observations and my own views in relation to the anatomy, physiology, and pathology of the human teeth after their development.

My observations have been made upon sections from every portion of teeth of different ages.

The teeth, as is well known, are entirely different in their anatomical structure, as well as their functions and uses, from any other bony structure of the animal system.

The bones constituting the framework of the system, giving form and action in motion, furnishing cavities for the vital organs, are all of them covered, and, where hollow, lined with a membrane which furnishes nutrition to them, and, in cases of disease or injury, aids in their restoration.

On the contrary, the teeth are not susceptible of any vital restoration after injury or disease, with only a single exception—that is, of exostosis of nerve cavity resulting generally from wearing away of crown by natural use or friction, which will be noticed under the head of physiology and pathology, where it properly belongs.

When these organs have been once fully developed, they come to a stand-still state, or in other words, to a state of inertia.

The crowns of teeth have no animal covering, but, on the contrary, have a hard, adamantine covering, almost entirely composed of rock-like substance, chiefly phosphate of lime.

A tooth consists of a crown, neck, and fang, or root, occupied in the interior by a nerve pulp, membranes, and a system of blood-vessels. The membrane passing out at the apex of the fang furnishes covering to the fang, and attachment to the alveolus or socket. The surface of the fang under this membrane is covered by a substance somewhat different from dentine, which constitutes the body of the tooth, called crustæ petrosæ, and terminates after covering every portion of the fang at the neck, where the enamel meets it under the margin of the gum, which is adherent to the neck, except the loose margin which covers the beveled edge of the enamel.

It would be out of place here to speak of articulation of the teeth, or of their uses, as that subject is thoroughly understood by all intelligent members of the profession.

The ivory or dentine which forms the body of the tooth is white, dense bone, harder and more compact than any other bony structure, over two-thirds of which is composed of salts of lime, the balance of fibrous or animal substance.

This structure is made up of a system of capillary tubes, called tubuli, exceedingly small, ten thousand of which, placed side by side, in contact, would measure only one inch; so estimated by Carpenter, Quickett, and other microscopists.

These tubes commence at the nerve cavity, with open mouths, and radiate outwardly, never losing themselves or ending until reaching the enamel in the crown and crustæ petrosæ, and membrane in the neck and fang, with exceptions in the latter.

Specimens properly prepared present under high powers of the microscope one of the finest views imaginable; spread out on a fifteen-inch field, presents at one view many hundreds of tubuli.

The tubuli leave the pulp cavity nearly at right angles from all parts—portions of which they leave at perfect right angles, other portions slightly oblique, in the direction of cutting or grinding surface. All those that leave the nerve cavity at right angles generally pass in a direct line without any curve, and meet the surface at right angles. In molar teeth, in the crowns alone there are four or five points where the tubuli leave and terminate at right angles—that is, directly over the point of each corner or horn of the pulp, and under the centre of the grinding surface or centre of the depression or fossa.

(To be continued.)

PROCEEDINGS OF DENTAL SOCIETIES.

TRANSACTIONS OF THE AMERICAN DENTAL ASSOCIATION, AT ITS SIXTH ANNUAL SESSION.

BY DR. W. C. HORNE, NEW YORK.

(Concluded from page 90.)

FIFTH DAY.—*Morning Session.*

THE President called the Association to order at 9 o'clock.

The minutes were read and approved.

The subject of "Mechanical Dentistry" was taken up for discussion.

Dr. F. Y. Clark regretted that the report of the Committee was so largely occupied with the consideration of rubber. He gave his preference to gold and continuous gum as bases for artificial teeth. In his section of the country, dentists were not compelled to put in cheap plates; he would rather take to sawing wood for a living, than put in such cheap work as he had heard about. He referred to several improvements which were not mentioned in the report.

Dr. Kingsley proceeded to explain his manner of treating certain classes of irregularities of the teeth, stating that he should not assume that such appliances and methods had never been used before, although they were original with him, and he was not aware that they had ever been adopted by any one else.

Among the first requisites of these appliances should be simplicity, effectiveness, and easy controllability by the patient. It was far better

to spend a little additional time in the beginning, and perfect an arrangement which should prove thoroughly effective, and relieve the operator from annoying visits from the patient while the process was going on. The appliances for nearly every complicated case must be peculiar. The same principles will be involved, but the application may often require to be totally different. Where fixtures are to be adapted to models of the jaw, he regarded plaster as the only material by which an absolutely correct model can be obtained, no matter what position the teeth have assumed. In the removal of the impression the plaster will break, which is of no consequence, as the pieces are readily adapted to each other, and will only fit in their proper place, where they may be held in position by liquid silex or by wax upon the outside. In taking such an impression, hold the plaster in the mouth until, by testing that which remains in the vessel in which it was mixed, it will be found set sufficiently to break with a fracture, and not mash; then remove immediately from the mouth. The regulating plates should be as delicate as possible consistent with strength.

He drew a diagram of an upper jaw, in which the incisors were far in advance of their proper position, giving a pointed appearance to the lip; the bicuspids on both sides being within the arch. The whole resembled two sides of a triangle, of which the approximal surfaces of the central incisors described one corner, and the second molar on either side the other. He used a rubber plate with no air-chamber, but gold clasps around the second molars, although in most cases they would be unnecessary; but in this the peculiar tension would throw the plate out of place unless so secured. Air-chambers and clasps he never found to agree. The plate should be cut away back of the incisors to permit of their free movement; but all movement of the side teeth inwardly should be prevented. If force acted upon them it could only be from without, and any such pressure on the central incisors alone directed inwardly must move all the teeth except those secured by the clasps. To bring this force to bear in the simplest manner possible, a piece of gold was made into the form of a T, about a quarter of an inch long. The lower end of this T was formed like a staple or ring, through which a ligature could be drawn.

To bring this appliance into use, a ring cut from small rubber tubing is drawn through this eyelet or staple, and then attached to the rubber plate, reaching directly across from the second molar upon one side of the mouth to the second molar upon the other side, and in this position it is secured either by tying, or by cutting notches in the edge of the plate into which to catch it. The plate may now be introduced into the mouth, and its presentation is that of a plate in position, with a ligature of rubber reaching directly across the back part of the mouth and the T of gold dangling from its centre. Now bring the T forward, passing it between

the central incisors, the cross-bar of the T resting upon their labial surfaces and the stem passing between them; if in close contact, make sufficient room by wedging. The direct action of this appliance is to draw the centrals inwardly nearly the thickness of their crowns; by its indirect action all the side teeth were moved outwardly—the bicuspids about half their thickness. The patient, whose case is described above, is a girl of thirteen years; this appliance moved all the teeth into their proper positions in seven weeks from its introduction.

The only additional treatment which is required is a close-fitting retaining plate, which must be worn for a number of months longer; the patient being charged with the necessity of removing and cleansing it often. To restrain the incisors from resuming their former abnormal position, delicate rubber rings may be slipped over the incisors attached to the plate.

Dr. Kingsley was inquired of how he would regulate the superior lateral incisors when they were locked within the arch of the lower teeth. He said there were various ways, but he was inclined to consider the most simple and effective one, that of a gold band running across the labial surfaces of the incisors, to which rubber ligatures should be attached, embracing the offending laterals. Sometimes such a band is supported at its ends by tying with floss silk to the molars or bicuspids; but a more convenient way, when admissible, was to carry the ends of the gold band as far as the first bicuspid on either side, thence over its crown and palatal surface to be imbedded in a rubber plate reaching across the roof of the mouth. This makes a support for the band, which can be more readily removed than when it is tied on. With such a fixture but very few weeks are required to bring the teeth into position. There was no necessity of building up the molars to prevent occlusion during the process; the patient will not close the jaws enough to prevent the movement of the laterals; sometimes they will make the passage in a single night; there was not much danger of going too fast. When a tooth was turned in its socket, Mr. Tomes, of London, twisted it instantly with a pair of forceps. Dr. Kingsley believed that if such heroic treatment was safe, which was abundantly proven, we need not apprehend much danger from too sudden movements with our appliances.

Dr. Kingsley then proceeded with the details of another case, the patient being about thirteen, which he had anxiously watched during four years. He had done nothing with it until the last winter, as he had learned that when he did not know what to do—to do simply nothing.

The upper teeth were very large and very prominent, covering the lower lip and making it difficult to close the lips over them. The deformity was great, and the family expression in the mouth of the patient destroyed. He commenced by the removal of the first bicuspids, and then prepared to draw the front teeth back by ligatures attached to a

plate running across the roof of the mouth; but soon foresaw that if this only were accomplished, he should have the incisors greatly elongated and the cuspidati inclining backward. He then struck up a gold plate over the six front teeth, and soldered studs, about a half inch in length on the anterior surface, one against each lateral. To the ends of these studs, which projected just beyond the lip, were attached, with a movable joint, brass straps which reached up forward of the ears; a leathern skull-cap was made to cover the crown and reached down to meet these straps. A hook was sewed on each side, and one soldered on each of the brass straps against the cheek, and the skull-cap and the mouth fixture were thus connected with strong India-rubber ligatures caught over these hooks.

In addition to this external apparatus, the internal fixture, as before described, was also used, so that there was a strong upward and backward movement obtained from this combination. The result was that within five months the teeth were carried back to the second bicuspids, and *driven up into their sockets* nearly one-third of the length of their crown; the deformity was entirely corrected, and the family expression of the mouth restored.

Dr. Sheffield mentioned a case where he was endeavoring to increase the arch of the lower jaw.

Dr. Kingsley considered that one of the most difficult things we had to encounter, as there was so little room for the action of appliances.

Dr. Fitch suggested a case where only the wisdom teeth articulated.

Dr. Kingsley. The presence of the wisdom teeth would indicate an age at which any operation would be likely to be unsuccessful. If the patient was younger and the second molars were at fault, he would use the skull-cap with anterior traction, and if taken in time would feel sure of sufficient absorption.

Dr. Barker referred to the diagram, in which the superior lateral incisors were in position, the centrals being out of the line of the arch, and complicated the case by placing the cuspidati outside the arch with only half their crowns protruded, each superior bicuspid being so situated that the lower one closed on its inside, with but half enough space for the cuspidati between the laterals and first bicuspids. He remarked that such cases were usually maltreated by extracting the first bicuspids. His method was to make a rubber plate as described by Dr. Kingsley, except that he used no clasps, not finding them necessary when the point of attachment for the ligatures was properly selected. He applied his elastic ligature to the centrals as previously described, passed a strong silk thread round the cuspidati, working it into position at the neck of the tooth by means of a very delicate instrument and tying it securely. The object of the silk ligature was twofold: its presence excited just sufficient irritation to promote the further presentation of the tooth from its socket; it also enabled the operator to secure the rubber tubing in position,

which otherwise would be constantly slipping off. Having fastened the elastic to the cuspidati, he caused it to press upon the first bicuspid in its passage to the point of attachment at the back of the regulating plate. This single ligature would cause an enlargement of the dental arch by pressing the first bicuspids outward and backward at the same time that the cuspidati were drawn into their proper position. When rubber tubing of a good quality was not to be obtained, he adopted the plan of setting three or four rings one over another, tying them together while they were held in position on any round instrument. Ligatures should not be applied to the cuspidati before their roots were sufficiently developed, which point was generally reached when their crowns were half protruded. He would expect to draw the teeth into position in from six to eight weeks at most. He considered a careful study of the law of forces necessary in the correction of irregularities of the teeth.

Dr. Kennicott often found it very difficult to apply ligatures to the cuspidati when they were but partially protruded. He recommended that a retaining point be drilled in the enamel and a little screw set in, or knob of gold built out, round which a ligature might be caught, to draw the tooth down to its place.

Dr. McKellops used a regulating plate similar to that last described, save that it did not extend forward of the bicuspids, the ligatures being carried from the various teeth to be moved to a notch at the centre of the anterior margin of the plate.

Dr. Atkinson said where teeth were not fully erupted, Dr. Kennicott's was the only common sense plan. Ligatures should only be applied with the greatest circumspection; any long-continued pressure upon the dental ligament must be destructive to that membrane and to the tooth. Before the tooth could be changed from its position and fixed in a new one, the bony case must be absorbed by solution of the lime-salts and a new deposit obtained.

Dr. Allport's method of regulating was by hickory pins pressing against the teeth through holes in the plate, or by ligatures drawing them inward.

Dr. Colburn used a rubber plate closely fitting the palatine surface of the mouth and the inner portions of the teeth, so as to be held securely. From the centre of this plate, on a line with the tooth to be operated upon, he raises a standard of rubber, perforated to receive and support a rod of gold, silver, or platina, with a screw-thread cut upon its end for a nut of hard rubber or wood, which can be turned outward toward the tooth or inward toward the centre of the mouth. Pressure is created on the inner surface of the tooth by daily turning the nut a little in that direction; and a ligature from the tooth to the rod forward of the nut, which is then to be gradually turned inward, will create sufficient tension to draw the tooth into position.

Dr. J. Taft described a regulating plate made by Dr. Redman, of Cincinnati, which he preferred to all others. It consisted of a rubber cap covering the palatal arch and exterior surfaces of the teeth, which is thus firmly fixed in the mouth: cut away the plate in the direction in which any tooth is to be moved and insert wedges of wood, thrust through holes in the plate, bearing upon the tooth from without or within. The patient is able to put this plate off or on, or change the wedges. He considered this the best thing of its kind; it required no ligatures, was rapid in its action, and there could be no mistake about moving any tooth just in the direction desired. It operated in half the time of other appliances he had tried. One very great advantage was that the patient could himself remove the plate and keep it clean; it was not essential that a regulating plate should be worn constantly, it might be removed for a short time when necessary.

The regular order was now suspended, and the time of final adjournment fixed for Tuesday next at 6 P.M.

A resolution was adopted to extend the morning session to 2 P.M., to sit again from 3 to 5 P.M., and to dispense with the evening session.

Dr. Chamberlin presented casts showing the expansion of plaster. To overcome this tendency he mixed his plaster with equal parts of water and a solution of sulphate of potash, in the proportion of three or four drachms to one quart of water; an excess would do no harm, only causing a slightly alkaline taste.

The subject of artificial obturators for cleft palates was taken up, and Drs. McKellops, of St. Louis, and Kingsley, of New York, were invited to address the Association.

Dr. McKellops disclaimed in advance any originality in what he proposed to show the Association, but he asserted his claim of being the first to demonstrate it to the profession. Dr. Kingsley's obturator was beautiful and unexceptionable, but the description in Harris was not sufficient as a direction for making it. When he (Dr. McKellops) went to Europe he took Dr. Kingsley's models with him, and showed them to Messrs. Saunders, Tomes, and Sircombe; he showed them, but when asked how the obturator was to be made he could not tell, he did not know. In Paris he saw about seventy cases, the obturators being of different styles and materials. On his return from Europe, in company with his partner, Dr. W. N. Morrison, of St. Louis, he got up an instrument made of an ordinary impression cup with a gutta-percha extension; with this he obtained a plaster impression of the lower parts of the cleft palate, into which, when fully set, a couple of tacks were driven, plaster of a proper consistence was then introduced on either side, above the cleft, with the finger, more plaster piled on the first impression over the tacks, and this gently carried to its former place. When set, the whole apparatus was carried backward and downward, and then on removal a

perfect impression was found of the upper and under parts of the cleft. The doctor exhibited obturators made by Dr. Morrison. A pattern of the instrument is made in wax, which is tried in its intended resting-place, and being found all right, sectional copies are taken from the wax pattern in plaster, and from these models of type metal are made, which are used for vulcanizing. He found the greatest difficulty in obtaining suitable rubber. This process, as described, had been perfected in Dr. McKellops' office since his return from Europe, within eleven months; he now offered the whole of the knowledge which he had acquired on the subject unreservedly to the profession.

Dr. Kingsley said that the remarks of the preceding speaker sounded a little strangely to his ear. "He," said Dr. Kingsley, "presents the claim of being the first man who ever described publicly how to take an impression of a cleft palate, and shows us an impression taken by his partner, Dr. W. N. Morrison, and also, by implication, charges me with having withheld the knowledge on that subject from the profession." The speaker then referred to the American Dental Convention at Saratoga, in 1863, where, at the meeting of the Convention, and also on a following evening at a public meeting of the profession at the Clarendon Hotel, he fully described every detail of the method of taking impressions, and also the manipulations in making artificial palates.

He said: "I see many gentlemen now before me who were present at that time, and to whom I now appeal for confirmation of this statement, that the method then described was, in all essential particulars, the same as now claimed by Dr. McKellops, and for his partner, Dr. Morrison. I can name as among that number Drs. Sheffield, Watt, Taft, Searle, Palmer, Cook, and many others." He then asked Dr. Sheffield if this statement was not correct, who answered that it was. He referred to Dr. Dwinelle's article in the last edition of "Harris," saying that it was intended to be made as plain as it was possible to write it, and with this view the first cuts made by the engraver to illustrate it were rejected, on the ground that they attempted so much as to be confusing, and nothing would be learned from them.

He stated that there were a number of gentlemen in the profession throughout the country who, from these public descriptions, had carried out successfully the making of artificial vela. The first one that came to his knowledge was Dr. Moffit, of Harrisburg, Pennsylvania, in the winter of 1863, who, from the article alone in "Harris," accomplished it successfully. There was an abundance of proof that Dr. Dwinelle's article was sufficiently full and clear to enable persons of skill to succeed. And furthermore, Dr. Morrison visited Dr. Kingsley in August, 1865, more than once, spending many hours with him solely in receiving a complete description of the entire process.

Dr. Kingsley then gave a history of his connection with this specialty

from the latter part of the year 1859 to the present time, but as it was briefly given in the August number of the Dental Cosmos for 1866, it is not here repeated. He referred to the action of this Association at Chicago a year ago, in adopting in his absence a report, a portion of which was prejudicial to his reputation, and was written by a personal enemy. He believed, in the light of the facts now presented, that the Association must see the injustice of allowing such a report to be published.

The Association then adjourned to meet at three o'clock.

Fifth Day.—*Afternoon Session.*

The Association reassembled at 3½ o'clock, the Vice-President, Dr. W. H. Morgan, in the chair.

The report of the Nominating Committee was taken up, and, as finally adopted, is as follows:

Committee of Arrangements.—Drs. J. Taft, of Cincinnati; W. H. Goddard, of Louisville; H. R. Smith, of Cincinnati.

Committee on Publication.—Drs. L. D. Shepard, of Salem; T. B. Hitchcock, of Boston; James McManus, of Hartford.

Committee on Prize Essays.—Drs. I. Forbes, of St. Louis; W. F. Morrill, of New Albany, Indiana; G. W. Field, of Detroit; A. C. Hawes, of New York; E. A. Bogue, of New York.

Committee on Dental Physiology.—Drs. J. S. Dodge, Jr., of New York; W. W. Allport, of Chicago; H. S. Chase, of Iowa City.

Committee on Dental Chemistry.—Drs. E. Wildman, and T. L. Buckingham, of Philadelphia; Ambrose Lawrence, of Lowell.

Committee on Dental Pathology and Surgery.—Drs. W. H. Atkinson, of New York; Asa Hill, of Norwalk; J. L. Suesserott, of Chambersburg; W. W. Sheffield, of New London; B. F. Arrington, of Wilmington.

Committee on Operative Dentistry.—Drs. J. S. Knapp, of New Orleans; C. R. Butler, of Cleveland; G. A. Mills, of Brooklyn.

Committee on Mechanical Dentistry.—Drs. N. W. Kingsley, of New York; L. P. Haskell, of Chicago; I. A. Salmon, of Boston; C. Palmer, of Warren, Ohio; S. B. Palmer, of Syracuse.

Committee on Dental Education.—Drs. C. W. Spalding, of St. Louis; Geo. T. Barker, of Philadelphia; G. F. J. Colburn, of Newark.

Committee on Dental Literature.—Drs. R. W. Browne, of New London; M. S. Dean, of Chicago; E. V. N. Harwood, of Rutland, Vermont.

Committee on Voluntary Essays.—Drs. John Allen, of New York; E. N. Harris, of Boston; G. H. Cushing, of Chicago.

Dr. McQuillen having been named as chairman of the Committee on Dental Literature, he declined on the ground that he had already served in that capacity, and made a report to the Association. Believing, as he

did, that the continued usefulness and success of the organization depended upon developing the latent talents of new members, he was opposed to constantly reappointing old ones, and he therefore nominated Dr. R. W. Browne as a gentleman well qualified for the position.

On motion of Dr. W. C. Horne, a Special Committee on Dental Histology was appointed, to report at the next session. The committee to consist of Drs. J. H. McQuillen, of Philadelphia; Geo. S. Allen, of Newburg, New York; R. W. Varney, of New York.

On motion of Dr. B. F. Arrington, the following resolution was adopted:

Resolved, That a committee of one from each State be appointed to investigate the subject of dental decay in the various races and classes of people in this country, ranging between infancy and thirty-five years of age.

Dr. W. C. Horne presented amendments to the Constitution, providing for a Standing Committee on Dental Histology.

The discussion of the subject of the morning session was resumed.

Dr. Kingsley continued his remarks on Cleft Palate. He said, I shall not claim the floor, unless it is the desire of the Association that I proceed. Up to the time of the adjournment, my remarks were in answer to the implication that I had kept my processes secret. I presume you are all satisfied upon that point. It is my intention now to enter into a description of those processes as carefully and as minutely as possible, with no intention of slurring over or withholding anything. I must presuppose that you are somewhat acquainted with the subject, and if I presume too much, you will be kind enough to check me. I assume the position that any man who possesses sufficient mechanical ability to master this profession can carry this thing through successfully, particularly with the experience of the past before him. With a thorough knowledge of the principles which govern the whole subject, the mechanical manipulations are comparatively easy. It took me a long time to learn them; most of them I was obliged to discover for myself; and it was not until months and years had passed, and many patients had been experimented upon, that I felt settled in my own convictions.

My views have so often been given publicly on the propriety of performing the operation of staphyloraphy, that I shall only refer to it incidentally. I regard it whenever a surgical success, a practical failure, and nearly every surgeon of eminence now admits that these cases had better be referred to the dental mechanician. It is only to improve the articulation that we are called to interfere.

This is more or less defective in every case, according to the size of the fissure; although to this rule there are many notable exceptions. The greater the number of the organs involved in this deformity, the more defective will be the articulation; and yet, in some instances, the loss of

an organ which has been considered essential to the production of a certain sound does not always produce the supposed result; some other organ must be trained to a vicarious office. The speech of the ventriloquist, and the instances of good articulation after the entire removal of the tongue, come under the head of these exceptions. In the cases of congenital cleft palate it requires long and severe training of the remaining organs to overcome even partially the defect of speech.

A well-formed palate is of no less importance in the mechanism of articulation than the tongue, for it is dependent upon the tongue in coming in contact with it, and thus breaking up the voice as it issues from the glottis, making it into a variety of sounds, which come to be understood as a language. The difference between many of the sounds of the human voice are made entirely by the action of the palate. In the sound of "M," the voice is directed and continued entirely through the nose; "P" is the same sound, directed by the palate through the lips; and "B" is the same as "P," only that the sound accumulates the buccal cavity, and precedes the opening of the lips; this accumulating sound, which the palate directs into the mouth, if turned through the nares, would terminate in "M."

It is because of the great mobility required of the palate, and the power of closing perfectly these passages, that staphyloraphy fails to benefit the patient. The surgically formed palate is neither long enough nor sufficiently flexible. So we see why all non-elastic obturators fail, and must always fail to confer benefit.

The artificial palate, to accomplish its end, must not only be flexible, so as to accommodate itself to all the motions of the surrounding muscles, but it must restore, as far as possible, the form to the lost parts. It must fill up the fissure, beginning at its anterior extremity, or apex, and follow down the curve of the soft palate until it reaches the boundary of the fauces, which for this purpose is the base of the uvula, and then be reflected horizontally backward to such a length, that during certain muscular action it will close the passage to the nares. This horizontal extension must terminate in a thin, delicate, and drooping edge, to avoid irritation to the pharynx in deglutition.*

All the edges which come in contact with muscle must be thin and delicate, while all other parts should be as firm as consistent with the movements it has to execute. A flimsy affair will be driven out of the way by the tongue, and will impede rather than favor articulation. It must be so firm that the tongue can hold against it and interrupt certain sounds. The sound of "K" is the result of the conjunctive effort of the tongue, palate, and pharynx.

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* By reference to illustration on page 24, vol. viii. of the Dental Cosmos, this description will be more readily understood.

At the apex of the fissure the instrument should reach over the bone on either side, to obtain a support; and for this portion also soft rubber is very much preferable to any hard or unyielding substance.

The form in which the instrument is now made is totally unlike that of Dr. Stearns, while every requirement which was met by his is equally met in this, and it has the merit of much greater simplicity.

The instrument which Dr. McKellops exhibits here, made by Preterre, of Paris, and which is the same thing as claimed by Dr. Bogue, as his improvement upon mine, has hard rubber in its anterior portion. My experience teaches me, that if this is accurately adapted to the parts, it could never be tolerated with comfort, and if it is not closely fitted it is a worse than useless appendage. In the Preterre palate, this hard rubber portion is joined to the posterior part of soft rubber by vulcanization. I cannot see any reason which should justify such a course. The soft rubber in all cases is perishable, and when attached permanently in this manner, it compels the whole appliance to be only a temporary affair. The form of it also is such that it can never give the organs of articulation complete command of the voice; while it may be of some benefit to those wearing it, perfect articulation can never be the result of its use.

This instrument is made in a plaster mould, which is also but a temporary arrangement, which must inevitably work to the detriment of the patient, as it is not possible to produce as nice and perfect duplicates one of another as when a permanent metallic mould is made and kept for that purpose. It is far better for both practitioner and patient that this course be pursued, for the patient then becomes in a measure independent, and the practitioner saved from annoying trouble.

In regard to the process of making these appliances, let me say that if you will exercise plain common sense, be careful and thorough in all your steps, and with a knowledge of the principles which govern its construction, you cannot fail of success.

I have tried a variety of experiments in taking impressions. In my earlier experiments, I manipulated the parts to accustom them to the presence of a foreign body. I took several impressions, encroaching each time farther upon the sensitive domain, until finally the whole was accomplished. I made models, and struck up special impression cups out of sheet copper, to take the final impression; and various other unnecessary proceedings were resorted to, to overcome a lack of confidence, experience, and skill. More recently I take an ordinary impression cup, and make an extension of sheet gutta-percha from its posterior edge, long enough to support the plaster under the uvula, without the cup coming in contact with it, and put in a sufficient quantity of plaster, and introduce it in the usual manner. Occasionally it will fill the entire cavity, both above and below the palate, and *must be removed from the mouth as soon as it will fracture, and before it is fully set.* It will

break on a line with the margin of the fissure, and the portion above may be caught with a pair of tweezers, and carried backward until it can be drawn from its lodgment.

I would not advise, however, to attempt too much with the first impression; but after it is obtained, without much reference to its filling up the cavity above the palate, make a cast into it, and upon this cast fit an impression cup of sheet gutta-percha, with any convenient handle. Cover with a film of plaster, which will set quickly, avoiding a surplus to drip in the throat, and carry steadily, gently, and firmly to its position, and when fully set, remove it; it will be found to represent everything but the cavity beyond the fissure. If it has passed the border at the apex, it is better to trim it down; wash with a solution of soap, and prepare for the additional section, by introducing newly mixed plaster, with a spatula, into the cavity above the palate, avoiding any surplus below the border of the fissure. The manipulations at this point must be very rapid, and as soon as complete, the former impression must be again introduced and brought into contact with the fresh plaster, and so held until that is set; on displacement it will separate at the junction of the two sections, and the upper one can be removed as before described. It is necessary that this impression should give a perfect model of the superior surface of the palatine bone; but it is not absolutely essential that it should represent entire all the soft palate and uvula behind. The soft tissues, if proper care has been exercised, will be so impressed in the plaster as to indicate to a practiced eye the form they take beyond where the plaster comes in contact; and by the aid of a glass for examination, and a skillful hand, the parts may be carved out with considerable accuracy; but as their form is changeable, perfect representation is not necessary. Occasionally, however, the whole cavity, posterior to the soft parts, has been fully represented. It is better to make the model from this impression in sections, as the upper portions of the cavity will be more accessible. When completed, take sheet gutta-percha and work it into the form of the artificial palate desired, adapted to the plaster model, being careful not to make it as thick as it will ultimately be required, and when nicely formed in every respect remove from the model and proceed to obtain duplicates of it in elastic rubber.

Formerly I duplicated my pattern in hard rubber, polishing it up very carefully, so that there should be no danger in handling of destroying its shape; I find it no longer necessary; a more delicately trained hand enables me to use the gutta-percha without injury.

My process is to make a mould in sections, around this pattern, first of plaster, and duplicated in type-metal. There are no arbitrary rules for the external form of this mould, or its division into sections. The number and the form of the sections is a mere matter of convenience. The inner surface of the mould should be very carefully polished to give

a smooth surface to the rubber, and the sections very nicely jointed together, or the seam will make an unsightly and disagreeable ridge across the rubber palate.

The mould being complete, it is only necessary to pack it full of soft rubber compound, which works substantially the same as the hard rubber used for dental purposes. Warm the mould, and press into shape with a suitable clamp, and proceed with the vulcanization.

I am in the habit of conducting this process in steam, at a heat commencing at about 240 degrees, and running gradually up during four hours, and terminating at 260. Most elastic rubber compounds would be better to run at a still lower heat, and a longer period; avoid running too high, as the durability of the material is injured thereby. When removed from the mould, it is ready for insertion in the mouth, with a little trimming, with a pair of scissors; and if all the steps have been properly taken, it will go to its place with perfect ease, be worn with entire comfort, and prove admirably adapted to perform the mechanical functions of the natural palate. The beneficial results must come from persevering practice. I am in the habit of impressing this fact very forcibly upon my patients in advance. I agree simply to make them an appliance that shall be worn with entire comfort, and enable them to learn to articulate, and the responsibility of complete success must rest entirely with them. Some succeed most remarkably, and in a very few months have nearly obliterated the external evidence of the defect, and others are dull and slow in their progress; but all make improvement constantly under practice.

Dr. Morgan. In a case where the operation of staphyloraphy had been performed, and there was a union of the soft palate, and an opening in front, what would you do?

Dr. Kingsley. I had just such a case. The operation had been performed by Dr. Hullihen, eleven years before, the patient being then seventeen years old. The union of the soft palate and uvula was good for nearly an inch, leaving an opening through the hard palate, which was very nicely stopped with an obturator; but all to no purpose, although she had been under the training of several elocutionists.

I was at first tempted to cut through the soft palate, but afterward used it as a bridge, to support an artificial palate, which passed over and extended beyond it, of a suitable length. This was attached to an obturator, which covered the opening in the hard palate, and was simply an artificial extension of the fleshy palate made by the surgeon. It answered an admirable purpose.

Dr. G. T. Barker rose to express his feelings of gratification at the very clear and able exposition which Dr. Kingsley had given of his method of procedure in this most delicate operation. He moved that a vote of thanks be passed to Dr. Kingsley for his persevering and success-

ful efforts in producing artificial vela, and for his explanatory remarks of to-day.

Dr. W. C. Horne, in seconding the resolution, said he could affirm, of his own knowledge, that everything which had been explained here to-day regarding artificial vela had been as fully disclosed to the dentists of New York on two special occasions nearly a year since. The scrutiny of the profession was then fully and fairly challenged, and this was too late a day for baseless charges to have any effect.

Dr. Atkinson briefly supported the motion for a vote of thanks.

Dr. Bogue stated that he was that member of the Publishing Committee who wrote the addenda to which objection had been made. He stated that he had no personal animosity to gratify, but was simply actuated by a desire that the profession should have the benefit of the improvements in artificial vela which had been brought to its notice. He proceeded to read extracts purporting to be taken from letters from Dr. Kingsley to himself, in justification of his assumed position; and added that he was now ready to join with the Association in thanks for Dr. Kingsley's improvements.

Dr. John Allen warmly defended Dr. Kingsley from any imputations of insincerity.

The question was then put, and the vote of thanks passed *nem. con.*

Dr. Kingsley, in acknowledging the action of the Association, said that the members of the dental profession had always been his best friends, and he sincerely hoped that the most perfect harmony of thought, feeling, and action might always exist between them and himself.

At 6 o'clock, the Association adjourned to Monday at 9 A.M.

Sixth Day.—*Morning Session.*

The Association met at 9 o'clock, Dr. Morgan in the chair.

The Committee on Publication were authorized to dispose of the next annual report at their discretion to whom and at what price they please.

Dr. Horne, of New York, from a committee appointed by a special meeting of the members of the Association, held this morning at the Revere House, reported the following preamble and resolutions, which were unanimously adopted:

Whereas, The members of the American Dental Association have received marked kindness and attention during their sessions in the City of Boston, and are desirous of expressing their appreciation of these courtesies; therefore

Resolved, That our thanks are hereby tendered to the Authorities of the State for granting the use of the legislative halls for the purposes of this Association.

Resolved, That to our Committee of Arrangements and the dental profession of New England we owe a debt of gratitude for their unceas-

ing efforts to contribute to our comfort and pleasure, which we will ever hold in remembrance.

Resolved, That to the daily press we offer our thanks for faithfully reporting and publishing our proceedings.

The subject of "Dental Education" was then taken up for discussion.

Dr. Kingsley said he desired that this subject should be elaborately discussed; but he would be content with calling attention to its importance. The way to raise the dental profession was to elevate the individuals who compose it; and this was not to be done by merely graduating young men of vulgar tastes or habits. How few are there, among those with whom we associate as dentists, whom we would be proud to introduce to our best friends! We must have well educated young men to fill up the ranks.

Dr. Miller was well aware of the deficiencies which existed in the ranks of the profession. He would not recognize mere mechanical skill as evidence of ability on the part of any one to become a successful dentist. He would inquire into the tastes, habits, and culture of the applicant, before he would receive him as a student; and if in these points he was found wanting, he should refer him back to his trade or occupation. He knew dentists who took assistants for a few weeks or months, and then turned them out to prey upon the public. Until the profession put its veto upon such proceedings it would be overrun with impostors. Every dentist should reject all applicants for office instruction who would not devote as much time to study as is required of medical students; for his own part, he would take no student who would not promise to graduate at a medical or dental college. The dentist should be well educated in other collegiate courses; he hoped the time had come for raising him to an equal rank with the members of other branches of the medical profession. New England had caught the fire which had run through the Western States, and he was confident that it would prove a refining fire which should purge out a great deal of dross.

Dr. Colburn knew of no subject of greater importance to the profession and to the Association, than the advancement of the standard of dental education. A good dentist could only be made out of the right material, without which neither collegiate nor private instruction would avail. He must be a man of talents and of good artistic and mechanical tastes: a gem, however rough, might be polished and its beauties brought out; but if only a worthless stone, no amount of labor could impart the lustre which was latent in that it imitated. The public has its eye upon us; let us then follow out this idea, To say and do something that will educate the community; which will then appreciate us as men of taste, of letters, and of refinement. The doctor dwelt upon the advantages of local societies and representative bodies like the present; and advocated that the professors of dental colleges should deliver popular lectures on

the teeth and how to take care of them. He had done this in his own locality with great success, and believed it productive of lasting good.

Dr. Barker regretted to hear the statement that certain things would tend "to elevate the dental profession." He ever recognized a distinction between principles and the men who attempted to carry them out. The profession of dentistry had attained such a high point of development that no intelligent or educated person would hesitate to call it a *science*, well worthy the study of the best trained minds. The credit and standing of the national currency was not injured by an occasional counterfeit note, for it represented the strength, the honor, and the justice of the nation; so the existence of uneducated and ignorant dentists could not depreciate the truths which underlie dental science. It could not be contended that dental colleges were all that could be desired; there were, doubtless, defects in the very best, as apparent to their faculties as to the dental public; but there was to be in the future, he hoped, a more united front presented by the different institutions, through the medium of association and union in the requirements necessary for graduation. If this unanimity could be attained, it would tend to do away with petty jealousies and bickerings, criminations and recriminations, which ever tended to retard progress. Dental colleges were, however, powerless, unless the dental public were with them in their efforts for advancement. One of the most serious defects in the class of men who present themselves for graduation at dental schools was, that they had not been prepared by close study and early education for the courses of lectures. Private preceptors can in many instances greatly improve and advance young men, and he thought it the duty of each one who took office students to demand, not only that they should do a certain amount of work in the laboratory, and witness occasional operations in the chair, but that they should also devote a certain number of hours daily to close study. If this rule were observed, the classes of young men at our colleges would be enabled to grasp readily the truths and principles which were enunciated from the different chairs.

He took exception to the idea of a previous speaker, that the profession should demand from those entering its portals "the possession of a *medical* or dental degree," and avowed that a diploma from a medical college would give him no assurance that the possessor had a proper knowledge of dental science. He said this with all due respect to the schools of medicine, and the many worthy dentists who had, in times past, sought for and obtained from them the best instruction then attainable. Any one familiar with medical lectures was aware that not more than three or four hours were devoted to the consideration of the structure and diseases of the teeth. Who could expect from such instruction to obtain a knowledge of the minute anatomy of the teeth, of dental physiology, pathology, therapeutics, and chemistry, and of operative and mechanical dentistry? And yet, any practitioner accepting a student who expects

to graduate at a medical college, must be willing to assume the great responsibility of himself teaching these varied branches. That a mind so enlarged as to grasp all these specialties, and capable of imparting thorough instruction in them, existed in the dental profession, he did not believe. Those experienced in teaching in any one of these departments, knew that earnest and constant thought, study, and research were indispensable. Recognizing these facts, he looked upon the addition of a single chair of dentistry to a medical college as important and useful to the general student of medicine, but comparatively valueless to one about to enter upon dental practice. A thorough course of study, with the possession of a medical degree, should be counted as but preliminary to the course of dental lectures, if that object were in view. If, as we justly urge, dentistry is a specialty, and requires special study, let us uphold its honor and respectability by acknowledging that sufficient lustre is reflected upon its practitioners by the possession of its special degree. He honored those men who, graduates of medical and dental colleges, avoided the use of their medical degree, and adopted only that which truly represented their calling.

Dr. Kennicott said that the looseness of dental colleges in granting diplomas, and of some associations in putting most incompetent individuals in places of honor, defeated the best efforts of private practitioners. He gave point to his remarks by referring to an individual who, in a marvellously short space of time, had obtained a diploma, gone into business in a Western city, been elected president of a dental association, and when last heard of was selling railroad tickets.

Dr. Allport believed nearly all were agreed upon the requirements of the age as to the qualifications of the dentist. Few who are well informed would deny that he should be well grounded in the principles of medicine and surgery, and be a skillful manipulator. How to attain these qualifications was the practical question. It surely could not be done, as some do, by taking students without preliminary education, for six, twelve, or eighteen months, and then turning them out as accomplished practitioners. No young man would expect to learn to be a good shoemaker, carpenter, blacksmith, or druggist in any such length of time; the public and their instructors expect and demand of them that they shall work at least three years before they can be regarded as qualified in their calling. Yet many seem to suppose that knowledge or skill in dentistry come by intuition, and that little time is necessary to be spent in learning to practice it, and some who are regarded as respectable practitioners will, for a fee, encourage young men in this idea, and discourage them from attending dental colleges. That the colleges have been remiss in their duty in not demanding a higher grade of qualification before graduating their students, none will deny; but we have good reason to believe that that practice has passed away. He was informed that during the present session of

the Association, the professors present had had a joint meeting, and agreed to require a preliminary examination before matriculation, three years pupilage and two full courses of lectures in a dental college before graduation; and that honorary degrees shall be conferred only upon those who are truly skilled in their profession, and have practiced at least ten years. This is a step in the right direction, and if our colleges are properly sustained by the profession in this position, great good will result therefrom. With this stand taken by the colleges, what course should the profession pursue? To his mind the answer was clear and self-evident. Let every dentist in the land refuse firmly to take students unless they possess the natural taste and qualifications, which, if properly cultivated, would enable them to become reputable practitioners; and in no case for a less term than three years, unless they will agree to attend lectures and graduate from a dental college. If this were carried out, in ten years there would be such a reform in practice and respectability as to make ours the equal of any other of the learned professions.

Dr. Watt noticed that one of the colleges was not represented, and the others not fully, but he hoped that all would level up to the standard. The Baltimore and Ohio colleges were mainly formed by medical men, and set out to copy the medical profession, and, in so doing, had copied some weak points. One of these was allowing four or five years' practice as an equivalent for one year of the college term; this was inviting students to impose their ignorance on the public. When a young man, he was thus bribed to graduate too soon, and we have copied that defect; he hoped all the dental colleges would change this. The longer a man had been going wrong, the longer it would take to bring him right; he would rather lengthen the term of instruction in accordance with the time of practice, than shorten it at all.

Dr. Kingsley desired that the views presented might be carried out fully. Referred to the qualifications for entrance into the English medical colleges. No class stands so high among the learned professions in England as that of medical men. Formerly, none could enter the Royal Colleges of Physicians unless graduates of Cambridge or Oxford; now, other literary institutions were included, but four years of preliminary education are necessary before entrance upon the three years' medical course. An eminent practitioner of New York, of twenty-five years' standing, had said to him "that the whole course of dental education was wrong, we were attempting to make it too popular. The proper course was to select only men of refined and gentlemanly habits, acquainted with the usages of good society, appreciative of the fine arts, educated to handling delicate instruments, and give a longer course of instruction than heretofore." While he (Dr. Kingsley) was not prepared to indorse this in full, he felt like insisting upon a preliminary examination. The students should at least be conversant with such ordinary branches of education as would be

necessary to maintain a standing in the society of cultivated people. An acquaintance with the pencil, the brush, the graver, or the sculptor's chisel is a better preliminary training for a dentist than handling the plow or the heavier tools of the mechanic arts. The colleges had taken a position which must be sustained, and which would be productive of most beneficial results.

Dr. Spellman thought the dental colleges had done but little to elevate the profession. We have been educating ourselves by contact with one another, doing away with the crustaceous condition. If the code of ethics was to be lived up to, some legislative action on the part of the Association was necessary, and that would secure unity of action and feeling through all classes of dentists.

Dr. Knapp very briefly expressed his surprise at the low estimate put upon the labors of the dental colleges, and expressed his own very high appreciation of the results which had been attained through their instrumentality.

Dr. McQuillen said that if years of undeviating devotion of time, energies, and money, in an effort to advance the cause of dental education, entitled one to express an opinion on the subject, he thought he could claim it, and it was somewhat amusing for him to listen to individuals, who neither have given or done anything as yet in that direction, commenting on the glaring deficiencies that exist, the radical reforms which are demanded, and proposing measures the impracticability of which must be apparent to the most unreflecting minds. Passing over other points, he referred in particular to the demand for a thorough classical education on the part of those applying for admission into the dental colleges. Such requirements might with great propriety be demanded in an old country like England, and, while he fully recognized the advantage and importance of a classical education, he contended that it would be perfect folly to exact that in America at the present time. The vast majority of young men in this country are compelled to commence the work of self-maintenance at a period of life when those more favored are entering college; in this way many of the most prominent and useful laborers in the arts and sciences, particularly in our own profession, have been denied such opportunities, and yet by indomitable energy and perseverance they have overcome, by self-education, every disadvantage, and stand a favorable comparison with their more fortunate compeers, either at home or abroad. He questioned whether those who demanded a classical education on the part of others could stand the test of an examination themselves. He considered that a good English education should be required under all circumstances.

In a highly eulogistic review of the works of Dr. Franklin by the celebrated essayist, Lord Jeffrey, he advanced the opinion that a collegiate education would have greatly interfered with the independence of investiga-

tion and reflection which was a characteristic trait of that philosopher. Although not prepared to admit the correctness of this, he considered that the case of Dr. Franklin was a remarkable illustration of what could be accomplished by men determined on self-improvement; few, very few, indeed, could hope to effect what that great man succeeded in doing, but they could, at least, try, as he did, to develop to the fullest extent the talents which had been given to them.

While admitting that there was room for improvement in the course of instruction in the dental colleges, he contended that if the profession at large, and those who are so ready to condemn, had done in the past a tithe of their duty, or encouraged and strengthened by a hearty and liberal support the efforts of the teachers, there would be little room for complaint now. A professorial position in a dental college was no sinecure, and none but those whose hearts are in the cause would be willing to labor on, year after year, with the most inadequate pecuniary return for the time devoted, and particularly when subjected to unjust and ungenerous censure on the part of those who were constantly benefited by the exertions of the teachers. Who, he would ask, were the main-springs of the Associations, constantly stimulating the profession at large to renewed exertions? Strike from the records of the societies and from the pages of the magazines all that has been contributed by the members of the faculties of the colleges, and how much would be left?

A primary object with him in advocating the establishment of this Association was that it might be used as a powerful lever in elevating the standard of education, and his anticipations in this respect had not been disappointed, for the influence of this organization in promoting the formation of local societies all over the country had reacted most beneficially upon the colleges and the profession.

He deprecated, on the part of the colleges, any other course toward each other than that generous rivalry which consists in endeavoring to accomplish the greatest amount of good for the cause of education; and contended that the misrepresentations, vituperations, and personalities, too often employed by partisan writers, injured none but those who used such weapons, for the world at large generally questioned the motives of interested parties under such circumstances.

Dr. Lawrence, of Lowell, announced that Major-Gen. B. F. Butler was present in the State House, and moved that he be invited to visit the Convention.

A committee of three, consisting of Drs. A. Lawrence, W. H. Allen, and J. H. McQuillen, was appointed to wait upon the General and escort him to the hall. At eleven o'clock the General entered amid great applause, and was introduced to the Association.

The General, on being invited to address the Association, said this sudden call was a very great compliment, and one which left him without

fitting words to express his thanks for so great an honor extended to him by an association which represented so large a portion of the Union as does this. The dental profession, he said, had made more advancement within the last half century than any other, perhaps, because a greater need for such advance has been shown during that time. A full supply has always met the wants of any age in science. One hundred years ago, the Atlantic cable, he said, would have been an impossibility, because there was no need for it. It required, in order, the canal, turnpike, railway, and steamboat communications, thus step by step laying the foundation for the introduction of telegraphic communication. There is no better illustration of the advance of art than that beauty everywhere seeks aid to increase its attractions. Had the profession been as able eighty years ago as to-day, the face of the Father of his Country would never have been disfigured as seen in the portrait by Stuart. To the dental profession, he remembered, was due the conception and successful development of one of the greatest discoveries of the age—that of anæsthesia. He had been the delighted spectator, though an unwilling one, of its use on a great and extended scale. To the use of chloroform and ether he attributed the most remarkable fact in surgical science, that out of 90,000 men who passed through the hospitals of the Department of Washington, only six per cent. of them lost their lives; an unprecedented extent of cure resulting from surgical operations, and which was without comparison.

After referring to the developments in mechanic arts, the General added: "May we not therefore hope that there shall be an advancement in political science, the science of government, as there has been in the steamboat and the telegraph, in the locomotive and in the great relief of human suffering, and may we not believe that our nation will be the banner nation in bringing government as near perfection as human affairs will permit, until at last such government shall be established, not only in this country, but all over the world, as to allow every man to represent the fruits of his birthright, and be the equal of every other man if he can!"

Renewing his thanks for the very agreeable and courteous honor done him, the General bade the Association adieu, and wished the members God-speed to their homes.

The following resolution, proposed by Dr. Miller, was then unanimously adopted:

Resolved, That this Association is happy to see and hear Major-General Butler, and it also wishes he had been in command at New Orleans one week ago to-day.

A short recess was then taken to allow those members who desired it an opportunity to be introduced to the General, after which he retired amid much applause.

Upon the resumption of business, Dr. H. J. McKellops offered the following resolution, which was passed:

Resolved, That the urgent request of this Association be extended to all the members of the dental profession who may have in their possession anatomical, physiological, or pathological dental preparations, or specimens, to place them in the museums of the dental colleges, that they may there be of the greatest use to the profession.

The following resolution, offered by Dr. Lawrence, was then adopted:

Resolved, That Dr. W. H. Atkinson is entitled to the lasting gratitude of the dental profession for his general introduction of the mallet into dental practice, and for his kind and efficient teachings in its use.

Dr. Atkinson, in acknowledging the vote, stated that his first knowledge of the use of the mallet was by D. E. Merrit, of Pittsburg, Penn., who employed it in condensing the surfaces of his fillings as long ago as 1838. He thanked the Association for its action.

Dr. Spalding presented an invitation from Dr. N. C. Keep, to the members of the Association, to spend the evening at his house, which was accepted.

Dr. Watt proposed an amendment to the Constitution, providing that dental societies shall be required substantially to adopt its code of ethics, to entitle them to representation in this Association; and that any member expelled from a local society shall be ineligible to membership in this Association from that date.

Dr. Kennicott presented a resolution offering prizes for essays, which was laid on the table.

Dr. A. Lawrence proposed an amendment to Article V., Section 1, of the Constitution, to the effect that the Nominating Committee shall present *one* or more nominees to the offices in the gift of the Association.

The discussion on Dental Education was then resumed.

Dr. A. Hill expressed his profound conviction that dental colleges had effected a great advance in dental education. They first lifted up their standard, and had drawn the whole profession up to it. The time may now have come for another advance. Earnest, courteous rivalry was to be commended; while a personal dignity should be attained sufficient to repress private animosities and party cliques. Some of us have turned out students too easily and too cheap, and they have proved to be practitioners who were hardly fit to become students. He had been in the profession thirty years, and was conversant with all the difficulties of establishing colleges. Though he had had only four students in that time, he had received a great many applications, and had found it almost invariably the case, that they had the impression that dentistry could be learned in a very short time. Many never urge upon their students the necessity of a thorough professional education. He closed with an appeal for a hearty support of the dental colleges.

Dr. McKellops considered the dental profession an American institution. He did not believe in the need of a classical education; many of

our most prominent public men had never received it. Instead of quarreling with the colleges, he favored endowing them, so that they might graduate deserving men gratuitously.

Dr. Spalding regarded dental education as the corner-stone of our profession; if that failed, advance became impossible. He claimed that the colleges had done and would do their duty; but they were not sustained. Private pupilage must be followed by a college course to insure thoroughness; and this would give the colleges a sure basis, while a contrary course weakened them.

Dr. Fitch. A dentist ought to be a man of broader culture than a medical man: he should be at home in all the domain of the latter, and his own specialty besides. Dental colleges also should have all the facilities of a medical college, and their own special department in addition. As it is, the professorships cover too much ground, and the mass of information to be obtained needs longer time.

Dr. Taft said the struggle for advanced dental education had for some years been a single-handed fight against strong opposition; it was only lately that the profession at large had been stirred. The tendency had been to make a reputation broader than the base upon which it stands, like an inverted pyramid: the effort of the colleges was to make the foundation so broad and sure that the superstructure could take care of itself. Men usually get all the reputation they deserve, and the dental profession was no exception to this rule; if we want a higher reputation we must pursue a course that will bring it. The teachers in the profession have long felt this state of things. We want to recruit the ranks of the profession with young men who possess the characteristics of manhood in an eminent degree; whereas, the most ignorant have heretofore entered in without hinderance. Of all the ten or eleven thousand dentists in the country, this Association represents not much more than a thousand, leaving all the rest to go their own way. What should we do with them? Get into local societies all worth having, and adopt a uniform course of procedure. On those who are worthless bring such restraints to bear that they shall be compelled to qualify themselves or give up. If local societies cannot reach them, legal enactments can. Some of the States have laws bearing upon this subject, North Carolina and Ohio among them; Missouri would enact such a law this winter probably, and other States were moving in the matter. Our efforts must rise with the demands of the day; the medical profession expect us to live up to our own claims, and there we should meet them. Though the dental colleges had not had due encouragement, they were rapidly rising, and would soon be out of sight of those who did not march in the ranks of progress.

Dr. A. Lawrence said there were duties lying anterior to those of the

colleges (which are well enough, and the teachers hard working men). We should be quite certain our student is a man of common sense—horse sense—sense enough to come in when it rains; we can't expect our oak to flourish without good roots. He would not consider it an objection that a man had had a college education. But what to do with him? Teach him the mysterious art of mixing plaster! What studies should he pursue, and how long should they be continued preparatory to entering college? These being important questions which he was not disposed to answer off-hand, he offered a resolution calling for a committee of three, to draft suitable suggestions on the acceptance of students and the preparation necessary for their entering dental colleges; which was adopted.

Dr. Warner, of Michigan, said the dentists of his State had pledged themselves not to take students for a less term than three years, and a college course in addition. When this was universally carried out, it would have a very beneficial effect. He believed in fostering the profession by State action.

Dr. Riggs never wished to see dental colleges hold the relation to the profession that literary institutions do to their alumni. They induce a chronic mode of thought, and we seldom get an inventor from them, or an original genius of any kind; their deep-worn channels exclude proper modes of thought. He did not believe men brought up in New York parlors were likely to become lights of the profession; or that overgrown institutions, with professors of aldermanic proportions, in the enjoyment of rich sinecures, dealing out sheepskins and parchments, could take the place of private study. He placed his dependence for the advancement of the profession on the sturdy sons of agriculture, who could gain all that is essential from their library shelves.

Dr. Wetherbee would have colleges well established and graduate such men as would be in advance of those they go among; then require every man to show his card, until the system had worked its way throughout the land. No man of genius would lift his hand against a collegiate course. He hoped every one would strive as much as in him lay to forward this good cause by precept and action.

In accordance with the resolution of Dr. Lawrence, the Chair appointed Drs. Lawrence, Fitch, and Taft a committee to draft suggestions on the qualifications of dental students; and discretionary power was granted to print and distribute the same at the expense of the Association.

Dr. Atkinson said listening is the duty of him who would learn the position of angels. This profession was his best beloved of earth, nearest the upper regions. None of us were illuminated up to our highest ideal. He was on the record for a much higher standard, and division of the chairs of dental institutions. The chair of anatomy never had been

divided, as it should be, into four specialties, and these divided, again and again, until a code should be pronounced worthy of the name of Dental Institutes. He favored six months instead of four for the length of the term. It has been the opprobrium of dentists to be indorsed highly with miserable qualifications. He would rather take boys of fifteen, and elect them to professorships, with the certainty of having better results in fifteen years. Make men appear as they are, and we can soon tell who are able to teach. He would prefer the honest man to the wire-pulling politician. He entered his protest against accepting positions for short terms, with ulterior purposes. A dental professorship is no place for large men of aldermanic proportions; it is no sinecure. Let us do our duty, and leave the consequences to Him who is able to take care of them. Love of truth and sincere affection for our fellows will very soon redeem the lowest among us, and crown him as equal to the best.

Dr. McQuillen said that a thorough knowledge of the scientific records of the past, combined with an earnest, persistent desire and effort to enlarge the boundaries of science, by making some additions to it, were indispensable requisites on the part of those who aspire to, or assume the position of teachers in collegiate institutions; and he who lacked the former could only be compared to the blind leading the blind. The reliable and effective teacher was not to be found in the cold, pedantic professor, who, impressed with the importance of his position and person, assumed a false dignity, and a "*noli me tangere*" air, so as to keep everybody at a distance, and prevent his shallowness from being discovered; nor yet in the long-winded declaimer, who, without system or order, pours forth a heterogeneous mass of material with the most astounding volubility; but in the constant, indefatigable student, who, thoroughly familiar with his subject-matter, endeavors to impart his information to others in the most simple, unpretentious, and attractive manner possible. Recognizing that students, like children, should be well grounded in the elementary principles, such an instructor, in place of entering into details, incomprehensible to the beginner, would dwell in the first place on the broad outlines of science, and show how a multiplicity of apparently isolated facts hold the most intimate and important relations with each other, and then, in a gradual and regular manner, unfold, step by step, the entire subject. There was a possibility of dividing and subdividing the departments of science taught in the colleges to such an extent that, in place of benefiting the student, it would prove greatly to his disadvantage. He had very little confidence in precocious children or men; and parents and preceptors are very apt to be disappointed in their fond expectations of such prodigies.

The Association then adjourned to 3 P.M.

Sixth Day.—*Afternoon Session.*

The Association was called to order at half-past three o'clock, the Vice-President in the chair.

Dr. Morgan announced that the Committee on the new preparation of crystal or sponge gold was not able to report fully, but that so far as they could judge, the gold welded under moisture.

The minutes of the morning session were read; but objection was made by Dr. McKellops to the wording of the resolution of thanks to General Butler; he moved to reconsider the vote by which the resolution was passed. This was a scientific body, and he did not wish politics to be mixed up with science; he did not come here for that purpose.

Dr. Miller, of Worcester, said he presented the resolution at the morning session without any political bias or intention to create sectional strife. It was out of appreciation for the able remarks of the General and his executive ability.

Dr. Forbes, of St. Louis, said he would like to know if the gentleman (McKellops) objected to this resolution or objected in a general manner. If it was to this particular resolution, he hoped it would be allowed to remain on the records. General Butler, he said, was well known for his loyalty, and if a man was a secessionist at heart he would call this resolution a political one, but if a Union man he would make no objection to it. Had the General remained, he said, in New Orleans in his official capacity, we should never have been pained with the recital of such a terrible massacre. General Butler's reputation for putting down anarchy was world wide, and this resolution only noticed in an appreciative manner what was universally known.

Dr. Clark, of Savannah, said he had been persecuted at home for his Union sentiments, and he had met with little else since he had been here; but he opposed anything like politics being introduced into the proceedings of the Convention.

Dr. Spalding, of St. Louis, presented a resolution requesting the Committee on Publication, in making up the Annual Report, to exclude all papers of a political character. This resolution was laid on the table.

A motion to reconsider this vote renewed the discussion.

Dr. Miller, the originator of the resolution, very earnestly said he was surprised that any objection had been made to it, as it was introduced only from patriotic motives.

Dr. McQuillen said he was surprised that any objections should be urged against an expression of appreciation of true worth and genuine ability, in favor of one who had demonstrated in an unmistakable manner remarkable executive capacities by establishing and maintaining law and order under the most adverse circumstances, and particularly when among

the victims who had fallen in that inexcusable and barbarous massacre of unarmed people, was a member of our own profession. He would yield to no man in love for and devotion to science, but with him the claims of an outraged humanity rose superior to all other considerations. Recognizing as he did the rights of all men, and with no disposition at such a time as this to conceal his sentiments, he hoped that no considerations of policy or expediency would induce the Association to swerve in the slightest degree from the path of duty, but by retaining the resolution on the record prove itself true to liberty and humanity. It was by the presentation of an undivided and unbroken front at all times and under all circumstances by loyalists, that we could hope to see law and order established throughout the land. In this way alone could we expect to see the day when we may freely express our sentiments in favor of truth and justice without apprehension or molestation in the North, South, East, or West.

Dr. L. D. Shepard, of Salem, said that while he was in full sympathy with the sentiments contained in the resolution, he hoped that it would be reconsidered for the sake of harmony. As it stated merely an opinion, it would do no good nor give any advantage to the General or the Society, but rather harm, in preventing the formation of local societies in the South, and the presence of delegates to the next annual meeting. Let the past be past, he said, and trust those who have repented. The doctor contended that "we, at least, who are in the majority, should be magnanimous, and not place upon our records a mere optimism."

Dr. Lawrence, of Lowell, said that, as a friend of the General, he would most respectfully inform the Convention that it could take such action as it thought best without incurring the chagrin of the General. If he had supposed that any such discussion would have taken place, he never would have brought General Butler into the Association.

After some further discussion of a kindred nature, the resolution was determined to be incorporated in the records of the Association, the motion to reconsider being lost by a vote of 18 to 10.

The subject of dentifrices was then taken up for consideration. The use of all liquid washes was generally condemned, on the ground that they are alkalies. The object of tooth-powders, it was contended, was to assist the brush in its friction over the teeth. Tonics were recommended as a very important and desirable element of tooth-powders, but they should not be too astringent; oftentimes the friction of the brush was sufficient to give a healthy tone to the teeth and gums.

The discussion was interrupted by the introduction of a resolution that all dentifrices in a liquid form should be repudiated. After some further discussion, the whole matter was laid on the table.

Dr. Spalding, of St. Louis, presented the protest of Drs. McKellops,

Goddard, Smith, Gifford, Spalding, Knapp, Cushing, Clark, Morgan and Leach, against the action of a majority of the Convention in refusing to reconsider the vote by which it was "wished that General Butler had been in New Orleans one week ago." The grounds of the protest were that the subject-matter contained in that resolution "is regarded by the undersigned as wholly foreign to the legitimate objects for which this body was organized."

On motion of Dr. Spalding, this protest was ordered to be placed upon the records of the Association, and published with the same.

The time of final adjournment was changed to two o'clock on Tuesday.

The Association then adjourned to Tuesday at 10 A.M.

In the evening the members of the Association were entertained by Dr. N. C. Keep, President of the Massachusetts Dental Society, at his residence, No. 76 Boylston Street. The occasion was productive of much pleasure, and the freedom with which sentiment and good-fellowship were interchanged greatly enhanced the enjoyment of the entertainment.

SEVENTH DAY.—*Closing Session.*

The Association assembled at 10 o'clock, the President, Dr. Fitch, in the chair.

A committee to investigate the subject of dental decay in the various races and classes of people in this country, ranging between infancy and thirty-five years of age, was appointed, consisting of one member from each State, as follows:

Dr. B. F. Arrington, of North Carolina, Chairman: Drs. I. A. Salmon, of Massachusetts; W. H. Atkinson, of New York; J. T. Metcalf, of Connecticut; J. Taft, of Ohio; J. L. Nourse, of Kentucky; G. H. Cushing, of Illinois; J. Richardson, of Indiana; J. A. Harris, of Michigan; E. G. Cummings, of New Hampshire; O. R. Post, of Vermont; A. B. Robbins, of Pennsylvania; W. H. Morgan, of Tennessee; F. Y. Clark, of Georgia; J. S. Knapp, of Louisiana; Wm. G. Lord, of New Jersey; J. Peebles, of Missouri; A. P. Sales, of Iowa; F. N. Seabury, of Rhode Island; and D. W. Perkins, of Wisconsin.

Dr. J. S. Knapp, of New Orleans, then explained his method of "cylinder filling" of a proximal cavity in the second inferior molar.

The process as explained was afterward discussed by Drs. I. J. Wetherbee, C. P. Fitch, and Kennicott, of Chicago.

Dr. Corydon Palmer explained, in the absence of Dr. Allport, that gentleman's method of treating exposed pulps by amputating the upper portion in such a way as to leave flaps which would unite together and heal by "first intention." He exhibited some instruments which he had constructed for the purpose of performing the operation; and stated that the success attending the plan of treatment had been of the most satisfac-

tory character, the remaining portion of the pulp having been found in a perfect state of vitality in several instances when examined some time after the performance of the operation.

Dr. McQuillen said the operation just described did not commend itself to him; on the contrary, he believed that the treatment of such a highly vascular and sensitive structure as the dental pulp, in the manner proposed, would be followed in the vast majority of instances by periodontitis and subsequent alveolar abscess. Even in cases of apparent success, he denied that "union by the first intention," as claimed by Dr. Allport, would supervene in the reparative process, as the flaps could not be formed so as to bring about the perfect adaptation of part to part demanded under such circumstances. He considered that it was a matter of decided moment that speakers and writers, when using scientific terms, should use them correctly or not at all; definite meanings are always attached to them, and their improper use was calculated not only to induce confusion, but sometimes to lead to the most deplorable results.

The Committee appointed on the rubber question submitted their report through their chairman, Dr. E. G. Leach, of Boston.

After detailing the labors of the commission, they announced that the Dental Vulcanite Company had accepted their proposition, which makes an agreement as follows:

I. Liability to commence May 1, 1865, and to be estimated at the amount agreed upon as future rate.

II. A discount of fifty per cent. to be made on amount found to be due July 1, 1866.

III. The fifty per cent. actually paid to be refunded in equal yearly payments of twenty per cent. per annum from the future payments under the license.

IV. The rates of license shall be $1 for all plates bearing six teeth and under, and $2 50 per plate for all over that number.

After the report was submitted, some little discussion arose, and the question was asked as to whether the company would protect any dentist who took out a license by prosecuting all who were using the rubber without permission.

Mr. Bacon, treasurer of the company, stated that such a clause would be inserted in the licenses.

The report of the commission was then adopted.

Dr. Morgan, of Nashville, Tennessee, from the commission, said that the form of license would be submitted to the commission before becoming binding upon the Association.

On motion, Dr. Geo. S. Allen was taken from the Committee on Physiology and put on the Committee of Histology, as originally proposed, and his place on the former committee filled by Dr. Allport.

A vote of thanks to the officers of the Association was then passed.

The President, Dr. Fitch, thanked the Association, in terminating his labors, for the kindness and courtesy which he had received from them.

The members from Cincinnati extended an invitation to all the members of the Association to be present at the meeting next year.

After various congratulatory remarks, the Association adjourned to meet in Cincinnati, Ohio, on the last Tuesday in July, 1867.

NEWARK DENTAL ASSOCIATION.

BY J. B. DA CAMARA, NEWARK, N. J.

A MEETING of the dentists of the City of Newark, N. J., was held June 19th, at the residence of J. B. Da Camara, Jr. Dr. C. P. Fitch, of New York, was called to the chair; Dr. G. F. J. Colburn, Secretary.

After being highly edified by a few pointed remarks from Drs. Wm. H. Atkinson, C. P. Fitch, and J. S. Latimer, of New York, it was unanimously

Resolved, That, in view of the fact that the rapid progress of dental science is mainly attributable to the benefits derived from dental associations, we feel that in order to maintain our position in the profession, as well as to secure to our patrons that skill which is alone the result of, and can only be acquired by, *patient study and persistent effort*, it becomes our duty as well as our pleasure to form a dental society in this city, for mutual improvement and professional elevation.

A committee was appointed by the Chair, consisting of Drs. G. F. J. Colburn, R. J. Reed, and J. B. Da Camara, Jr., to draw up a constitution and by-laws. It was further

Resolved, That the Secretary be requested to invite all members of the profession in this city to attend a meeting to be held at the residence of Dr. R. J. Reed, on Tuesday evening, June 27th, at 8 P.M.

At the appointed time the meeting was called to order, Dr. R. J. Reed in the chair; G. F. J. Colburn, Secretary. The constitution and by-laws were read by Dr. J. B. Da Camara, Jr., and adopted; after which the following officers were elected for the ensuing year:

President.—Dr. Wm. G. Lord.

Vice-President.—J. B. Da Camara, Jr.

Secretary.—G. F. J. Colburn.

Treasurer.—R. J. Reed.

Meetings to be held on every first and third Wednesday evening during the year.

Members of the dental profession from all parts of the State are cordially invited to attend our meetings, and their applications for membership will be gladly received.

PERISCOPE OF MEDICAL AND GENERAL SCIENCE IN THEIR RELATIONS TO DENTISTRY.

BY GEO. J. ZIEGLER, M.D.

Functions of Living Beings.—"A study of Natural Philosophy has led in recent times, perhaps more than that of any other branch of science, to an elucidation of the functions of living beings. What are physical and what are vital actions has long been a subject of discussion. The attraction which the sun exerts upon the earth, that which the earth has upon the magnetic needle, and that which one chemical substance has for another, though differing entirely in their nature, are called physical; but the attraction which the intercellular substance of cartilage exerts upon the lime-salts dissolved in the blood, or that by which any other tissue selects and draws from the liquor sanguinis what enters into its substance, is called vital. Again, the conduction of electricity along a nerve is physical; the conduction of nervous influence along a nerve is vital. We know nothing of the nature of any of these actions, which constitute ultimate facts in science; but, inasmuch as they are not identical we call those which occur in living beings vital. Some of these are altogether peculiar, such as growth in particular directions, muscular contractility, nervous excitability, and mental acts. We observe, however, in a living being, that these properties are more or less dependent upon, mixed up with, and give direction to physical properties. It is the determination of what is due to the one class of phenomena and what to the other, as well as their mutual relations, that has for some time engaged the attention of what is called the physical school of physiology.

"And here it must be confessed that, just in proportion as the physical have been made to encroach upon what were supposed to be vital actions, our knowledge has advanced. It has now been proved that much of what was mysterious must be considered due to gravity, imbibition, endosmose, or chemical, electrical, and mechanical operations. Now, as the laws regulating these physical forces are better known to us than such as govern the vital ones, not only in this way can we comprehend them better, but, when required to modify them by art, we are enabled to do so with more effect. We cannot, therefore, too strenuously urge forward all that physical research can do for us, although still conscious that, while in this way we may learn much, physics, no more than chemistry, will ever wholly clear up the mysteries which surround the great fact of life.

"It is curious, however, to observe that while chemistry has succeeded in manufacturing in the laboratory many of the excretory products of the body, such as urea, taurine, allantoin, formic, oxalic, lactic, butyric, and other organic acids; so the histologist, by the mechanical union of oil, albumen, and mineral matter, has succeeded in forming artificial molecules, nuclei, cells, membranes, and concretions, very similar to what we find in the animal. True, in both cases we must take the proximate principles, which can only be formed by nature; but these given, we learn much of the structural mode of formation and of the chemical decompositions occurring in the animal from what physical experiment has taught us."—(*Extract from an Address to the British Med. Association. By* JOHN HUGHES BENNETT, M.D., F.R.S.E.—*Dublin Med. Press.*)

"*On Certain Painful Affections of the Fifth Nerve.*—Lettsomian Lecture, delivered before the Medical Society of London, Session 1865–66. By FRANCIS E. ANSTIE, M.D., London, Fell. Royal Coll. of Physicians, Senior Assistant Physician to the Westminster Hospital.

"LECTURE II.—*Mr. President and Gentlemen:* In my last lecture I recapitulated the principal facts in the anatomy and physiology of the fifth nerve which bear on my subject, and especially directed your attention to the light which experimental lesions of the nerve, at or near its central implantation in the medulla oblongata, are calculated to throw, not only on the painful symptoms, but also on the secondary affections (of nutrition, secretion, vaso-motion, etc.), which often complicate the diseases we are considering to such an extent that their original character is apt to be lost sight of.

"On the present occasion I propose to briefly sketch the clinical history of those painful diseases of the fifth nerve which I shall endeavor to convince you are related to each other by the important circumstance that an organic defect in the central origins of the nerve is probably a constant factor in the production of the symptoms.

"I shall commence with an enumeration of certain circumstances which, so far as I know, are noticed at the time of the outbreak of the pain in *all* the members of this group of diseases. They are three in number. 1. Notable general nervous debility, preceding the attack for some time. 2. Triviality of the apparent exciting cause in proportion to the severity of the symptoms. 3. A peculiar condition of the circulation, in which there is great variability in the amount of arterial pressure.

"1. With regard to the pre-existence of general debility in cases of neuralgia, there has been much difference of opinion. Among those who have denied the clinical fact, Valleix is the most considerable authority. But all that Valleix, in his very careful and valuable treatise, proves is, that many sufferers from neuralgia have been, previously to the attack, distinguished by a rather conspicuously good condition of tissue-nutrition, as shown by their muscular strength, their complexion, and their plumpness. The same thing might, however, be said of numerous epileptics, in whose case it would be hardly possible to deny that a weakness of the nervous system had existed from birth, having been transmitted organically from an epileptic parent. And there are also many positive signs of a more or less general feebleness of the nervous system which can always be detected, even in the most robust-looking sufferer, from any of the affections of the fifth nerve which form my subject. Sometimes the history points out the fact that severe mental or physical fatigue has been at work upon the nervous system. It has occurred to me, for instance, to see pregnant women, otherwise in seemingly robust health, in whom severe neuralgia has suddenly set in, which neuralgia has been incontinently ticketed as 'sympathetic.' But inquiry into these cases has always shown that the nervous system, and very usually the nerve actually affected, had given abundant proof of its debilitated condition long before the outbreak of the pain. For instance, in the very common case where the frontal nerves are the seat of the pain, the woman will tell you either that she had noticed, in past times, that common headache, when it attacked her, was always limited to the now affected side; or else that obscure symptoms, such as lachrymation and congestion of the conjunctiva, spasm of the eyelid, or partial anæsthesia of the skin, or unaccountable and temporary failure of sight, limited to the side which now suffers

from distinct neuralgia, had been occasional visitors for a long time, perhaps ever since puberty.

"2. The second general characteristic of the diseases which we are considering is the trivial character of the apparent exciting cause of the actual pain. A fright, a wetting, the shock of a not very severe fall, a hæmorrhage, not more copious than hundreds of parturient women suffer without the least evil result—such are the accidents which wear the plausible appearance of being the originators of neuralgic attacks, even of the greatest severity and obstinacy. Even in the case where so definite a thing as malarial poison is the apparent exciting cause, we are not to forget that the total proportion of cases in which malarial poisoning exhibits itself in the form of *nerve-pain* is comparatively inconsiderable.

"3. The last general feature to which I shall call your attention is one which, so far as I know, has not yet been clearly set forth by any author: I mean the great mobility, so to speak, of the nervous apparatus governing the circulation of the blood, which is certainly very common, and I have reason to believe will be found universal, among the subjects of trifacial nerve-pain. The sphygmograph of Marey showed me this. Being myself liable to neuralgia of the fifth nerve, and having observed the extraordinary and unusual variations of arterial pressure which my pulse indicates under the varying circumstances of fatigue and freshness, fasting, comfortable repletion or difficult digestion, mental repose or excitement, etc., I have watched narrowly for the same fluctuations of pulse-form in a large number of persons. The result is, that violent fluctuations of pulse-form under circumstances calculated to affect the nervous apparatus of the heart, and also of the contractile smaller arteries, appear to be characteristic of a temperament in which either neuralgia or some of the allied nervous affections is apt to occur. [The lecturer exhibited a number of enlarged diagrams of pulse-forms illustrative of this observation.] I believe also that *trifacial* neuralgics are more distinctly the subjects of this condition of the circulatory apparatus than other neuralgic persons.

"I proceed now to describe the clinical history of the different varieties of the diseases which we are studying. I shall speak first of the simple forms—*i.e.* of the cases in which the nerve-pain is practically the only important symptom; secondly, of the secondary affections by which any of these forms may become complicated.

"I. Under the first head I shall make the following subdivisions:

"1. Pains of the fifth nerve immediately excited by malaria.

"2. Pains of the fifth nerve belonging to the period of bodily development.

"3. Pains of the fifth nerve belonging to the period of bodily decay.

"4. Pains of the fifth nerve excited by anæmia, or by underfeeding.

"5. Certain reflex pains of the fifth nerve.

"1. As to the malarial neuralgiæ of the fifth nerve, I am compelled to speak with reserve. Like most London practitioners, my experience of these affections has been limited. In fact, though the out-patient practice of the Westminster Hospital and the Chelsea Dispensary has afforded me a considerable number of examples of *ague* in past years, I have only seen two undoubted and one doubtful case of malarial neuralgia of the fifth nerve. The periodicity in one was regular tertian; in the other regular quotidian. An algide condition always ushered in the attacks; but was gradually exchanged, as the pain continued, for a condition in which the pulse was remarkably rapid, soft, and bounding, and the strength

was still further depressed. In both of these cases there was unilateral flushing of the face and congestion of the conjunctiva, to a slight degree, during the painful attack. The pain became duller and more diffused contemporaneously with the progressive arterial relaxation; and, after the disappearance of active pain, moderate tenderness over a considerable tract around the course of affected nerves remained for some days. But there was no development of any of the persistent and exquisitely painful *points* of Valleix (to be hereafter mentioned); a fact attributable, I believe, to the circumstance that quinine treatment cut short the malady in each case, very rapidly.

"2. Trigeminal nerve-pains of the period of bodily development. The period of bodily development includes, of course, the whole time from birth up to the twenty-fifth year (roughly speaking). But that portion of it which is antecedent to puberty presents few or no cases of facial nerve-pains in which the state of the nerve is the central pathological fact. From the moment when puberty arrives, however, all is changed. In the stir and tumult which pervade the organism, and especially in the enormous diversion of its nutritive and formative *nisus* to the development of the generative organs and the sexual instincts, the delicate apparatus of the co-ordinating nervous centres is apt to be overwhelmed (or rather left behind) in the race of development. The most frequent of the painful affections of the fifth nerve which are traceable to this source is *migraine*, or sick headache. Its clinical history is as follows: Under the pressure of the bodily influences already referred to, and often of a further debility induced by precocious straining of the mental powers, the patient begins to suffer headaches after any unusual fatigue or excitement, sometimes without any distinct and obvious cause of this kind. The unilateral character of the pain is not always detected at first; but as the attacks increase in severity it becomes obvious that the pain is limited to the track of the supraorbital, and sometimes the ocular, branches of the ophthalmic division of the fifth nerve of one side. In very rare cases, however, as with any other form of trifacial neuralgia, the nerves of both sides are affected. If the pain lasts for any considerable length of time, nausea, and at length vomiting, are induced. This is followed at the moment by an increase in the severity of pain; but from this point the violence of the affection usually so far relaxes that the patient soon succeeds in falling asleep. The history of the attacks distinctly negatives the idea that the vomiting is ordinarily remedial. This symptom merely indicates the point of lowest depression of nervous power; but as the power of digestion is almost entirely suspended during the attack, it may sometimes happen that a quantity of food which has been incautiously taken, lying as it does undigested in the stomach, may of itself greatly aggravate the headache by irritation transmitted to the medulla oblongata. In such a case vomiting may produce direct relief to the nerve-pain. When the patient awakes from sleep, the active pain is gone. But it is a common occurrence, indeed it always happens when the pain has lasted a considerable time, that a *tender* condition of the superficial parts remains for some hours, or even a day or two. This tenderness is diffused over a considerable surface, and is nowhere so exquisite as that which is observed in the 'painful points' of Valleix, which are developed in the severer neuralgiæ. Sick headache is not uncommonly ushered in by sighing, yawning, and *shuddering*—symptoms which remind us of the prodromata of some graver nervous affections, with which I shall hereafter indicate its probable relationship.

"Another kind of headache which infests the period of bodily development is that which is known as the *clavus hystericus* (*clavus* from the fact that the pain is at once very severe, and is limited to one or two small, definite points, as though a *nail*, or nails, had been driven into the skull). As Valleix has well shown, the points to which the pain is confined in these cases correspond with one or more of the localities which are the *foci* of severest pain and tenderness in all forms of trifacial nerve-pain. But for the greater limitation of the area of the nerve-pain, there would be scarcely any important distinction between *clavus* and *migraine;* for the former, when the attack is unusually severe and prolonged, generally culminates in a fit of vomiting, just like that of ordinary sick headache, and is followed by a superficial tenderness, only more limited in extent than the soreness which follows sick headache. The adjective *hystericus* is of course an inadequate and improper definition of the circumstances under which this form of trifacial nerve-pain arises. The truth is that the subjects of *clavus* are usually females who are passing through the trying period of life between puberty and the complete development of the organism; but there is no evidence to show that disorders of the uterine functions give any special bias toward this complaint. But migraine and clavus are met with frequently enough in persons who have long passed the period of bodily development. But the important circumstance to observe is, that the tendency to these forms of nerve-pain nearly always shows itself during that period.

"3. The next group of painful affections of the fifth nerve to which I shall refer includes those which distinguish the period of bodily decay. The commencement of this period is not to be fixed at any particular year; although, as an average statement, we might with tolerable safety adopt the age of forty. I understand it as coinciding with the whole duration of those retrograde changes in the nutrition of tissues of which the first that we can recognize are the atheromatous and earthy degenerations of the walls of arteries. The affections of the fifth nerve which characterize this later period of life are of two very different kinds, of which the history, the development, and, above all, the prognosis, are widely dissimilar. The first of these groups consists of various painful affections, the characters of which are not dissimilar, on the whole, from those of many cases of neuralgia occurring in debilitated persons of much younger age. We note only a certain predominance of the pain over some of those secondary affections which in younger subjects would be often of nearly equal development with it; and a degree of rebelliousness to treatment, which is also not commonly met with earlier in life. Still, these affections are mostly curable with patience and appropriate remedies. But the other class of trifacial nerve-pains which occur during the period of bodily decay is very different; it corresponds with those severe cases which have been classed as 'tic epileptiforme' by Trousseau, and of which Romberg is doubtless speaking when he says that the true neuralgiæ of the fifth rarely occur before the fortieth year of life. These affections are distinguished by the intense severity of the pain, the lightning suddenness of its onset, and the almost total impossibility of effecting anything more than the most temporary improvement in the patient's symptoms. But they are also distinguished by another circumstance which too often escapes attention—namely, they are almost invariably connected with a family taint of insanity, and very often with strong melancholic and suicidal tendencies in the patient himself, which do not

depend upon, nor are commensurate in their development with, the intensity of the pain he suffers. They are further remarkable for the special frequency with which they are attended with two complicating affections—namely, muscular spasms of the face, and the development of exquisitely tender 'points.'

"4. The pains of the fifth nerve which are due to anæmia or to bad feeding may occur at any time of life after puberty. There is nothing characteristic or determinate in their symptoms, and the point to which I wish to call your attention in their history is the fact that the severity of the patient's sufferings is by no means in the direct ratio of the anæmia or debility which he exhibits. It is obvious that something in the constitutional habit of the sufferer determines, far more powerfully than the accidental state of his nutrition and general strength, the severity of his complaint.

"5. Finally, among the forms of painful affection of the fifth nerve for which I suggest a common organic cause in the condition of the nervous centre, are included those remarkable cases of 'reflex' neuralgia which have apparently resulted from injuries to some distant part of the body. Three such cases have come under my care. One of these was an instance of neuralgia of the fifth, supervening upon a knife wound, which divided the occipital nerve. The other two were instances of the same affection occurring after wounds with a sickle, which divided all the structures, down to the bone, on the ulnar side of the forearm, not far above the wrist. In all these cases the family history gave plain evidence of an extraordinarily strong tendency to neuralgic affections; and only by some such explanation can I at present understand such cases as these. How very many persons annually sustain injuries of a precisely similar character, and how very few ever suffer from neuralgia of the trigeminus! It is impossible for me to avoid the belief that the difference in result arises from a radical difference in the condition of the centres through which impressions conveyed from the wounded part of a physiologically distant nerve, like the ulnar, *must* have passed to reach the trigeminus at all.

"One circumstance should be particularly noted in the history of all these three cases—viz., that the neuralgic pain only commenced after cicatrization of the wound had taken place, and after the cicatrix had reached nearly its maximum degree of firmness. So long as the wound remained open no neuralgia was felt. The moment at which the pain commenced was that at which a connection had been re-established between the spinal cord and the peripheral ends of the nerves which had been severed; which connection must have been maintained by intermediate material of a low organization, for the *perceptive* sensibility of the parts beyond the wound remained greatly impaired. That the mental perception of the patient should in each of these cases refer the pain, not to any point in the course of the injured nerve, but to the branches of the trigeminal, affords, in my opinion, a strong suggestion that that portion of the central nervous system with which the trigeminal is directly connected presents some congenital or acquired peculiarity of organization. But upon these subjects I shall have more to say under the heading of Etiology and Pathology."—(*Lancet.*)

"*On Anæsthesia by Mixed Vapors.*—MR. ROBERT ELLIS read a paper on this subject before the Obstetrical Society of London. In opening, Mr. Ellis said it would be taken for granted that the administration of

mixed anæsthetic vapors possessed certain advantages over that of pure chloroform, counteracting the depression produced by the latter agent, and giving great security to the anæsthetic art. But the difficulty consisted in the due application of these vapors, and up to this time the anæsthetic fluids had been simply mixed together, and their resulting vapors administered. It was then shown that the whole theory of anæsthetic mixtures, and especially of those recommended by the chloroform committee, was based on an error; this being the idea that the vapors of each fluid would rise from the mixture in the same proportions as those of its constituents. A large number of experiments were detailed, the object of which was to prove in the clearest possible manner that this notion was wrong from the commencement. Anæsthetic mixtures were shown to give off their respective constituents in vapor as nearly as possible in the order indicated by their boiling points. Thus ether came off in largest quantity, and alcohol in the least; and it was found that it was not possible to construct any formula for an anæsthetic mixture which would give off a definite and unvarying constitution of vapor from first to last. The patient consequently would be inhaling a mixture of vapors of different character at each moment of evaporation, and no reliance could thus be placed upon these compounds. The author, therefore, denounced the whole practice and theory of anæsthetic mixtures in the fluid form as uncertain in their effects, and not to be depended upon for practical employment. Mr. Ellis, however, believing in the great value of a true system of anæsthesia by mixed vapors, was led to the discovery of a simple means by which this anæsthetic method might be carried out in practice. In the instruments exhibited to the society the following principles were completely carried out:

"1st. The anæsthetic fluids were evaporated in distinct and separate chambers, and their vapors were combined in an air-chamber on their way into the lungs.

"2d. The proportions of each vapor were regulated by a most simple mechanical contrivance.

"3d. It was impossible to give an overdose of either ether or chloroform in consequence of the peculiar adjustment of the receptacles for those fluids.

"Without entering into the details of construction of these inhalers, the author drew attention to two very important features in his invention, which he believed likely to influence for good all future forms of chloroform instruments. The first of these was the method of only liberating a certain number of minims per minute of chloroform or ether. This was effected by an adaptation of the self-acting law of capillary attraction. And the other was the powerful evaporating surface of a frilled description, by which he could saturate the inspired air with the powerfully stimulant vapor of alcohol. He estimated at a high rate the value and importance of these adjustments, and invited the close attention of the meeting to their excellent performance. The fluids employed by the author were pure chloroform, ether, and alcohol; and so great was their economy of use that, in anæsthesia for such an operation as ovariotomy, extending over half an hour, scarcely two drachms of chloroform were used—an allowance of less than four minims per minute, or only *three-quarters per cent. of chloroform* in the inspired air. In midwifery practice, in which the author claimed for his system many special advantages, he seldom used more than from sixty to ninety minims of chloroform per hour.

"Dr. Sansom thought the observations of the author most valuable, as urging upon the attention of the profession the necessity of a proper dilution of chloroform. From his own experience he was assured that by the ordinary rough means adapted to administer chloroform it was common to allow an atmosphere of from ten to thirteen per cent. to be inspired. Dr. Sansom explained his theory of narcotism, especially the action of narcotics upon the calibre of the arteries. A typical anæsthetic would be one which would not, on the one hand, like chloroform, rapidly abrogate the functions of the sympathetic and paralyze the heart, nor, on the other hand, 'overstimulate'—*i.e.* by contracting the arteries, throw a large volume of blood upon the venous system. Chloroform acted best when freely diluted, but, unlike the author, Dr. Sansom considered that this dilution could be effected without special apparatus. Ether was ineffectual for dilution, because, from its volatility, it nearly all evaporated away from its mixture with chloroform; and its excitant as well as nauseating properties were objectionable. But from great numbers of experiments (many of which Dr. Sansom detailed), he was convinced that in chloroform diluted with an equal bulk of absolute alcohol we have an excellent anæsthetic, which gives off a proportion of chloroform vapor in a given time almost exactly half of that which is given off by chloroform pure and simple. As to Mr. Ellis' instrument, though most ingenious, he thought, as anæsthetics were for the many and not for the few, we should recommend such a process as will render anæsthesia safe, and be encumbered as little as possible with mechanical complications.

"Mr. Ellis, in reply, stated that he could scarcely sufficiently forcibly dwell on the fact that the fluid anæsthetic mixtures gave off uncertain and varying compositions of vapor—a fact clearly demonstrated by many of the experiments he had detailed, and that, therefore, they were not to be relied upon. Especially in midwifery practice this grave error, in consequence of the duration of inhalation, was most manifest. He could by no means agree in the remarks of Dr. Sansom as to administering as high a percentage of chloroform as four per cent. He was, by his system, perfectly well able to obtain speedy, and to sustain prolonged, anæsthesia with an allowance of barely one per cent., the security and well-doing of the patient being, in his opinion, in exact proportion to the diminution of the dose of chloroform. The vapors of ether and alcohol mixed with it seemed in an extraordinary manner to enhance the activity of the chloroform, and safely to sustain its force. He begged in conclusion to exhibit to the society a perfectly new form of his inhaler. This instrument he had especially designed for his use in midwifery. It was simple in construction, and of equal safety in use with the more powerful inhaler. Its principal feature was a beautiful little reservoir for chloroform, which, acting on the principle already alluded to, dropped that fluid over an evaporating surface, at any rate per cent. desired by the operator. The instrument was thus effectually protected against an overdose."—(*Lancet.*)

"*Local Anæsthesia.* By B. W. Richardson, M.D. (London.)—Dr. Richardson gave a demonstration before the British Medical Association of his method of producing local anæsthesia, with directions for various operations. He explained, as a new truth, that the principle of general anæsthesia is identical with that of local anæsthesia, the difference being that in general anæsthesia the brain is cut off from the local part, and in local anæsthesia the part is cut off from the brain."—(*Med. Times and Gazette.*)

"*Local Ethereal Anæsthesia.*—A series of operations have been performed by M. Demarquay, at the paying hospital of Paris, advantage being taken of pulverized ether. Dr. Richardson's apparatus was employed with a slight modification. Instead of the two India-rubber balls, only one is used, and the air is forced into it by a small air-pump. M. Demarquay says that with the pump an ounce of ether is vaporized in one minute. The pump is worked with more or less energy, according to the thickness of the jet."—(*Lancet.*)

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"*Extreme Disease of the Bones of the Cranium.*—DR. MURCHISON (hon. sec.) exhibited to the Obstetrical Society of London for Mr. Bickersteth, of Liverpool, a specimen in which the whole surface of the cranium was covered with a nodular bony growth. The lower jaw was also affected, and was enormously enlarged. The only other bones affected were the hyoid and one fibula. The disease began at the age of fourteen in the bones of the skull, which became gradually larger and larger. The patient did not suffer much until two years before his death, which took place at the age of thirty-five. The pain was in the fibula, and was so exceedingly severe that it was believed to have been the cause of death. There was no history of syphilis in himself nor in his parents, and after death all the internal organs were found to be healthy."—(*Med. Times and Gaz.*)

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"*No Cicatrix after Operation on Young Child.* Jefferson Medical College, Surgical Clinic of PROF. GROSS. Reported by DR. NAPHEYS.—Lizzie W., aged two years and four months. One year ago, at this clinic, a sebaceous tumor was removed from the forehead of this child. There is a slight depression corresponding with the situation of the tumor, but beside this there is no evidence whatever of a scar. This shows that when an operation is performed at this early age, and the parts are brought well together, there is little danger of a cicatrix, and, in a great majority of cases, there is none whatever at the time of puberty. The depression existed prior to the removal of the tumor, it having been caused by the absorption of bone."—(*Med. and Surg. Reporter.*)

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"*Epulis.*—Rachel G., thirty-five years of age, colored. She has had a tumor on the lower jaw-bone for eight years. It involved three teeth, two in particular, the incisors. It is very vascular, the slightest touch causing it to bleed. A portion of it is of florid complexion, the rest is livid. The tumor projects in front as well as behind, and evidently involves the alveolar process. It pains a little at times. It has grown a good deal for the last three years. It is hard, inelastic, in great measure incompressible, and plainly fibroid in character.

"This belongs to that class of tumors known in books under the name of epulis, growing upon the gum; but, in fact, they grow from the gum, and very frequently from the lining membrane of one or more of the teeth. The teeth become implicated in the morbid growth, as well as the alveolar process, and sometimes the entire jaw.

"This tumor is probably not malignant in its character, belonging to the class of recurrent fibroid tumors. There is nothing to be done in the way of dissecting it out. In order to do justice to this woman, it is necessary to remove two or three teeth along with the alveolar process. Even then there may be reproduction.

"The middle incisor was extracted, and the tumor removed with a portion of the alveolar process. The bone that was left was sound. The apparatus of Dr. Richardson, of London, for the application of ether spray, with the view of producing insensibility of the part, was employed during the operation, with the effect of apparently diminishing the pain." —(*Ibid.*)

"*Removal of the Superior Maxilla.*—Dr. William R. Whitehead, of New York, successfully removed a tumor of the superior maxilla from a young negro girl. It weighed about one-third of a pound, and was composed of numerous finely granular bodies, variously agglomerated, of different sizes and shapes. The osseous elements entered largely into the composition of the growth, becoming hypertrophied, and invaded with calcareous matter. Six days after the operation, the union of the parts was complete in the entire extent of the incision. The cheek was well supported, and the only deformity represented was a very slight cicatrix of the cheek. In the course of a few months, it was impossible to tell that there had ever been any deformity."—(*University Journ. of Med. and Surg.*)

"*Fracture of Inferior Maxilla.* Surgical Clinic of D. Hayes Agnew, M.D., Pennsylvania Hospital. Reported by Dr. Napheys.—The fracture of the lower jaw in this man is situated a little to the right of the median line, passing completely through the alveolar processes, as well as the body of the jaw. The accident was caused by his falling from a cart, the wheel of which passed over the injured part.

"There has been much trouble in the management of this case, in consequence of the displacement which ensued. The outer fragment, attached to the ramus of the bone, was drawn inward and upward, in consequence of the contraction of the internal pterygoid and the masseter. Probably, of all the fractures the surgeon is called upon to treat, there is more difficulty in the management of those of the inferior maxillary, than of any other bone. There have been a great many methods suggested where there is this derangement of the parts, for getting them into line and so retaining them. A very common one is to tie the teeth together, when they are entire, with silk thread. For this purpose, wire has been substituted. Unfortunately, the teeth will soon become very sore or loose from the application of wire, obliging an abandonment of its use. Then there are all kinds of models adapted to the surface of the jaw. That made of binder's board softened in water, and accurately adjusted and secured by an ordinary Barton or Gibson bandage, answers an excellent purpose. Still, notwithstanding all these contrivances, there are some cases which will perfectly defeat all efforts, and unless something more effective is devised, there will be deformity.

"In this case, an apparatus has been made which may be called an interdental splint, as it is placed between the dental arches of the upper and lower jaw. It consists of two pieces of hard rubber, slightly grooved, one placed inside of the other, and the two united by screws. The two fragments are placed in the lower groove, and the screws are then tightened. If there be a tooth removed, a tube can be inserted, through which food may be drawn.

"The apparatus was placed upon the fragments, which were brought into line, the upper teeth being lodged in the upper groove, between the

two plates, and the lower in the groove below. The jaws were then bound together by a Barton dressing.

"The rubber not being acted upon by the secretions from the mouth, does not become offensive.

"Vulcanized rubber makes a much neater support for the jaw than any other preparation. By heating, it can be moulded into any shape desired, and adapted to the surface much more accurately than binder's board can be. It also makes admirable light splints for the arm and shoulder, holes being cut into it, where there is a compound fracture, to allow washing of the parts and drainage."—(*Med. and Surg. Reporter.*)

"*Epithelioma in the Lower Lip of a Female.* Under the care of MR. PORTER, Meath Hospital and County Dublin Infirmary. Reported by ARTHUR WYNNE FOOTE, M.D.—A woman, 77 years of age, was admitted early in the present month, under Mr. Porter, with an epithelial ulcer at the left side of the lower lip. The ulcer was oval, involving the free border of the lip and equal portions of its mucous and cutaneous surfaces. She had been a smoker for the last forty years; the present ulcer originated twenty years ago in a crack or fissure, which healed up and reappeared from time to time, until by degrees a distinct sore became established. Since the year 1861 twenty cases of epithelial cancer have been operated upon in the Meath Hospital, and of these but two were females. In connection with this circumstance, Mr. Porter remarked upon the predilection of this disease for the lower lip. The preference of this disease to attack the male sex and lower lip is observed in all countries. Of eighty-one patients affected with labial cancer in the practice of Riberi, of Turin, three of the cases occurred in women, and in only four was the upper lip affected. He also alluded to the advanced age at which this disease generally appears, and to the frequency with which this form of cancer appears to be connected with external rather than internal agencies. Though the disease is very frequently assigned to the irritation of a pipe, so much so, that the late M. Roux attributed the fact of his having met with a larger proportion of cancerous affections of the lips during the latter half of his surgical career to the increase in the practice of smoking, yet others have met with many cases of the disease in such places as among the peasantry of the mountains of Puy-de-Dome, and the vicinity where smoking is almost wholly unpracticed. The prevalence of this disease among the lower classes, which all have observed, is attributed by Riberi chiefly to local irritation of the lip from any cause, neglect of personal cleanliness, and exposure to the vicissitudes of the weather. From a statistical analysis of one hundred and twenty-seven cases of epithelial cancer, published in the *Medical Times and Gazette* of 1860, it is shown that women are the subjects of this disease in the proportion only of 5 to every 100 males; that when it does occur in women it is usually in those who have been accustomed to smoke; that the lower lip is affected in 90 per cent. of the cases, the angle of the mouth in 6 per cent., the upper lip in 4 per cent.; and that the average age of patients suffering from cancer of the lip is 58 years."—(*Dublin Med. Press.*)

"*Exostosis of the Fang of a Tooth, with Osteo-sarcoma of the Maxillary Bone.* By EMORY L. WILLARD, M.D., of Laporte, Plumas Co., California.—John C., aged thirty-two years, had suffered for fourteen years with fistulous openings in the left cheek, occurring one after another

—a new one succeeding the healing of the old. The cicatrices were distinct, so that they could all be counted, and they covered nearly the whole cheek. The discharge was exceedingly offensive, and contained spicula of bone. The patient was emaciated, his appetite and digestion being much impaired. But he still exhibited much natural energy of constitution. He came under my charge in April, 1862, when the probe readily detected the necrosed bone, extending over one-half the lower maxilla.

"Having determined to remove the diseased bone, I first cleansed the sore, and injected chlorinated water. The patient being etherized, I proceeded to cut down upon the diseased part from the inside, extending the incision from near the condyle forward about two inches. Through the opening thus made I extracted without difficulty the dens sapientiæ, the fang of which was enormously enlarged. The two adjoining molars had been lost through the disease. A cross incision was next made, so as to allow a full examination, and to admit of the removal of the numerous particles of bone, consisting of fragments of the outer lamina of the maxillary bone. Some of the fragments were near an inch in length by half an inch broad. By means of bone forceps and a saw I then cut away carefully all the diseased bone, consisting of from one-half to two-thirds of the entire structure.

"The after-treatment consisted of the daily application of the liq. hyd. pernitras, diluted with seven parts of rose-water, and the internal use of tonic bitters and iod. potassii. Valerianate of iron and quinia also were exhibited. The patient recovered rapidly, and was discharged in perfect health on the thirty-second day after the operation. I have seen him repeatedly since, and he has had not the slightest return of disease. There is not even any tenderness of the parts remaining.

"[Dr. Willard has shown us the removed tooth, the exostosis of which measures one and a quarter inches long, one inch wide at the extremity of the fang, and half an inch thick.—*Editor Journal.*]"—(*The Pacific Medical and Surgical Journal and Press.*)

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"*The Jaw from the Trou de la Naulette.*—We recently announced that a new puzzle had been found for the ethnologists and anthropologists in the shape of a lower jaw from one of the Belgian bone-caves. We have been favored with a sight of a cast of this bone of contention, and we will endeavor to describe it for the benefit of our readers. In the first place, it is only a fragment of a jaw, but it presents all the essential parts for specific diagnosis. It consists of about three parts of the body of the bone and a small portion of the left ascending ramus. The teeth are wanting, but the alveoli are all in remarkably good condition. From the full development of the sockets and the size of the bone, it is evident that it belonged to an adult. The bone is of considerable thickness, the symphysial portion being much thicker than in ordinary European specimens. The points of agreement with human structure are the following: The alveoli describe a parabolic curve; the molars are of large size compared with the premolars; there is no diastema between the canine and the contiguous teeth; the lower border of the bone presents the usual human characteristic in its perfect curve. The following are the differences between this bone and that of an ordinary European: In the first place, there is a total absence of chin. The anterior symphysial surface is slightly sloped backward. The posterior symphysial surface projects further and more abruptly backward than in the European or in any other

human jaw we have seen. There is an absence of the tubercles for the insertion of genio-hyoglossi. The alveolus for the canine shows that that tooth must have been of larger size than in the typical human subject. Of the three true molar teeth, the third or posterior molar was decidedly the largest, and had an implantation by three fangs. The first and second molars were of ordinary size, and were implanted by two fangs. In several of these respects the jaw may be matched among Australian specimens, but it presents wide differences from the jaws of Western Europe of the present period. In the following points it exhibits decided pithecoid analogies—the large size of the third molar and canine teeth; the abrupt projection backward of the posterior symphysial surface; the great thickness of the anterior portion of the bone, and the entire absence of mental eminence. The bone was found by Dr. Edward Dupont in the cavern of La Naulette, on the banks of the Lesse River, in a perfectly stratified deposit of sandy clay, under two layers of stalagmite, at a depth of three and a half metres (about eleven feet four inches) below the surface. In close contiguity with this jaw, and under similar conditions, were found an upper incisor and canine, presumably human; an ulna, certainly human; a piece of reindeer bone presenting a circular perforation made by some sharp instrument, and numerous remains of Elephas primigenius, Rhinoceros tichorinus, and Hyæna spelæa. The strata were perfectly undisturbed. We will not speculate upon the history of this remarkable specimen. Human we believe it to be, but of a type of humanity far inferior to any white race now existing. Were the supposition tenable that it is the bone of an ape, we should feel inclined to attribute to it the dignity of 'the missing link.' We hear that the Curator of the Anthropological Society is preparing a memoir on the subject."—(*Med. Times and Gazette.*)

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"*Perfect Mode of Solidifying Organic Tissues.*—Microscopists and others, who are successively engaged in the examination of organic tissues and albuminoid substances, will be glad to know of a method by which those bodies can be dried without the application of heat, and in which the original appearance of the freshly-made preparation will not be lost. The apparatus employed for this purpose is, in its simplest form, a well-closed glass crucible, filled with ether, at the bottom of which is placed the chloride of calcium, quicklime, calcined sulphate of copper, etc. intended to absorb the water. A shallow vessel is placed below the surface of the liquid for the reception of the substance to be dried. The ether continually yields its water to the chloride of calcium, constantly withdrawing it in turn from the substance to be dried, until finally the latter corresponds in its hydroscopic state with that of the desiccating agent. The thorough wetting in this manner of the constituent particles of the substance to be dried (which of course must be insoluble in the ether) prevents their sticking together, and the original appearance is retained when dry. The use of ether in a liquid form is frequently not necessary. The skins of animals, animal membranes, etc. readily assume, in an atmosphere saturated with the vapor of ether, and containing a suitably strong hygroscopic substance, a condition similar to that of white dressed leather."—(*Journ. of Applied Chemistry.*)

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On Disinfectants.—In the Chemical Section of the British Association for the Advancement of Science, Mr. W. Crookes read a paper (*Lancet*) in which he "showed the absurdity of using at the same time, in

the various parishes of London, disinfectants that were incompatible with one another, for when the streams of sewage meet from the different districts, the several agents exert reciprocally an antagonistic action, thus expending their energies in mutual destruction instead of uniting them in serviceable work. Oxidizing disinfectants produce their effect by the actual destruction of the infectant substance. Antiseptics act by destroying its activity. Of all antiseptics, those known as the tar acids are the most powerful, and of these, commercial carbolic acid is the best. In the presence of carbolic acid the development of embryonic life is well-nigh impossible, and before its powerful influence all minute forms of animal existence inevitably perish."

"*Death from swallowing Carbolic Acid.*—At Liverpool, last Friday, the relative of a patient in the hospital, who had died of cholera, went in a state of half intoxication to see the body in the dead-house. Perceiving a bottle of carbolic acid that had been left in the room he mistook it for rum, and swallowed a quantity. His death was instantaneous."—(*Ibid.*)

"*Deodorizing Properties of Ground Coffee.*—Dr. Barbier affirms that ground coffee possesses some remarkable properties as a disinfectant. In several cases where he had to make *post-mortem* examinations of bodies under *very disagreeable* circumstances, he found that a handful of coffee strewn over the body and about the room quite overcame any bad odor."—(*Lancet* and *Chicago Med. Examiner.*)

"*Animal Electricity.*—Dr. C. B. Radcliffe describes, in the *Proceedings of the Royal Society*, his success in obtaining indications of statical electricity from living blood, nerve tissue, and muscular fibre, by the employment of gold leaf electroscopes."—(*Intellectual Observer.*)

"*Artificial Ivory.*—We learn from the *Les Mondes* that an artificial ivory is made in France by M. Dupré from a simple paste of *papier-maché* and gelatine. Billiard balls formed of this material, though barely a third of the price of those made from real ivory, are yet so durable and elastic, that they can be thrown from the top of the house on to the pavement, or violently struck with a hammer without injury. With this same paste, to which the name of Parisian marble is given, among many other things, the finest and most complicated mouldings for ceilings can be made, or capitals of columns can be constructed in any color, so as to resemble the most valuable marbles."—(*Lond. Reader* and *Franklin Institute Journal.*)

"*Improved Electrotype Process.*—Christofle and Bouillet, of Paris, have introduced three great improvements into the electrotype process. They add to the silver bath, sulphuret of carbon, or an alkaline sulphuret, which produces a small quantity of sulphuret of silver; and this, for some reason not yet explained, causes the silver deposit to be, not dim and lustreless, but as brilliant as if it had been carefully burnished. They add to the sulphate of copper bath a moderate quantity of gelatine, which, for some reason, also as yet unexplained, causes the copper deposit to be as compact and dense as the very best rolled sheet copper. And lastly, they secure very great economy, by attaching plates of lead to the platinum wire, which forms the interior skeleton of the mould used for the pro-

duction of articles in relief. The results produced by this modification of M. Lenoir's process affords products yet more perfect than those obtained by casting and chasing."—(*Intellectual Observer.*)

"*Petroleum as Fuel.*—In the ordinary modes of using petroleum as fuel, there is very frequently produced a very large quantity of black smoke, which not only is very offensive, but a source of great waste. This is entirely prevented by mixing superheated steam with the petroleum vapor, as has been done for some time past in America, and more lately at Woolwich Dockyard; which causes the smoke instantly to disappear, and the whole fire-place and tubes to be filled with a bright white flame. We need not remark that the decomposed water causes no addition to the total amount of heat, since water absorbs the same quantity of heat during decomposition as its elements afterward give out during combination. The economy arises from the waste of a large part of the fuel, as smoke, being prevented."—(*Ibid.*)

Silver and Gold in Galena, etc.—DR. PERCY, in one of his Lectures on Chemical Geology (*Chem. News*), makes the following statements on this subject: "I was speaking to you, on the last occasion, of the sulphide of lead, galena, and I showed you a specimen of it beautifully crystallized by the agency of heat alone. I also gave you, I think, conclusive reason to infer that sulphide of lead may be crystallized, and very well crystallized too, by the action of liquids. The proof consisted in the fact of galena occurring in nodules of clay iron ore—a condition under which it is impossible that it can be the result of igneous action.

"There are one or two other points concerning the sulphide of lead which are very interesting. I refer to the constant association therewith of certain very important metals: I mean silver and gold. It may be laid down as a universal proposition, without any exception so far as is known, that all galena contains silver—*all*. There are varieties which contain a very small quantity of silver, and which are therefore said to be 'poor:' still, if search be made for the metal, even in the poorest kinds you never fail to obtain not only traces, but far more than traces, of silver. The silver in the sulphide of lead must, of course, exist as sulphide of silver. Galena is a source of a very large supply of silver in different parts of the world. It may be laid down also, not merely as a general rule, but, I believe, as a universal proposition, that all galena contains gold—*all* galena. Some years ago my friend on my right, Mr. Smith, and myself set to work to examine this point, and we made a great many determinations with respect to the presence of gold in the ore of lead and in various commercial compounds of lead. Forty specimens or more were examined, and every one yielded palpable, visible, unmistakable traces of gold. Still, the quantity of gold is so small as to be utterly worthless in a commercial point of view. Here are the evidences of these facts. Every single specimen of gold extracted in these experiments has been carefully preserved in hermetically sealed tubes, and the condition specified. It requires rather careful manipulation. In these experiments there was no possibility of error. There was nothing added in the way of chemical reagent, which might vitiate the result. The process consists of taking the compound of lead and simply submitting it to the well-known operation called cupelation by which silver is extracted from lead. There remains behind a very small globule of silver, and in that globule we are enabled to detect the gold by the simple action of a solvent of silver,

nitric acid, which leaves the gold. It has to be taken up with great care and transferred to a piece of blotting-paper. It is afterward gummed on to a piece of paper and then burnished, when the characteristic color of gold immediately appears. It is a remarkable circumstance not only that gold is detected in the ore of lead, but also in the various commercial compounds of lead—white lead, red lead, sugar of lead: nay, we have even gone further, and found it in lead fume, that is, the smoke that is volatilized from lead in the process of its extraction. We may, then, I think, safely conclude that lead contains always silver and gold. Perhaps you may object to the deduction with regard to gold as not being sufficiently supported. It is founded on forty examinations under various conditions. At all events the proof is strong, if not conclusive."

"*Substitute for Sodium Amalgam in Metallurgical Operations.*—The gold set free in extremely minute particles from crushed quartz, etc., is covered with an impalpable powder which protects it from the action of the mercury intended for its separation, and thus a considerable amount of gold is lost. In addition to this, the mercury thrown into a state of minute division by the agitation employed, being covered by the same impalpable powder, is incapable of reuniting; a considerable portion therefore assumes the appearance of a fine powder, and is carried off with the refuse; and thus a large amount of mercury is wasted. These two sources of loss have caused a great diminution of profits. It was, however, fortunately ascertained that the brilliancy of the mercury is restored, so that it will run together freely, and unite with the gold with the greatest avidity, if a minute quantity of sodium amalgam is added to it. Hence sodium amalgam is now an important article of commerce. It is considered highly explosive, and therefore very dangerous; but such is not the case, the explosive property of pure sodium on coming into contact with water is lost almost entirely when it is associated with mercury, so as to form an amalgam. But sodium amalgam is now likely to be superseded by a far less expensive, and it appears not less useful material. Caustic soda has not only been found quite as effective as sodium amalgam, but it is contended that the sodium in the amalgam actually assumes the form of caustic soda before producing its effect. A very simple experiment will show the efficiency of the soda. If a finely pulverized metallic powder is thrown into water, no amount of stirring will cause it to fall to the bottom of the vessel; it is rendered specifically lighter than the fluid by the coating of air which adheres to it. But if a very small quantity of caustic soda or potash is added it will soon descend from the surface to the bottom. It is supposed that the minute particles of mercury also, and of gold, are prevented from coming into contact by a coating of air, which the alkali removes in a way which has not yet been ascertained. This, if the real, is perhaps not the only effect produced by the alkali. The potash of soda must not be allowed to lose its causticity by exposure to the air during transport, etc., or it will be ineffective; it may have become a carbonate, without those who use it being aware of the fact."—(*Intellectual Observer.*)

"*To clean Tarnished Silver.*—Wash the silver over with a strong solution of cyanide of potassium. Simultaneously with the development of a very disagreeable smelling gas, the metal becomes bright, and must be immediately washed with water and dried."—(*London Chem. News, from Erdmann's Journal*, and *Am. Journ. of Pharmacy.*)

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ORIGINAL COMMUNICATIONS.

CLINICAL INSTRUCTION.

BY J. H. M'QUILLEN, M.D., D.D.S.

In medical colleges clinical teaching is divided into the medical and surgical; the first of which embraces the *examination* and *treatment*, on the part of a professor, before a class of students seated in a large lecture-room, usually in the form of an amphitheatre, of a number of patients suffering under various diseases, so that the students may learn how to diagnose different affections to determine the probable prognosis in each case, and what remedial agencies are indicated. In the surgical clinic the same course is pursued, and, in addition, the operations demanded are performed in the presence of the class by the professor of surgery. In the hospitals the same general course which prevails in the colleges is repeated. In this way much valuable information is imparted, and it is more than probable that this plan cannot be much improved upon in medical and surgical instruction before large classes of students. Under such circumstances, however, the students are mere *passive witnesses and listeners* of what another is doing or saying. They assume no responsibility by taking charge of patients, have no opportunity of testing their powers in diagnosing different affections, and gain no personal experience in the transactions.

In the dental colleges, on the other hand, in addition to clinical instruction on the part of the professors, each student has a chair assigned to him, patients placed under his personal charge, and the fullest opportunity afforded for acquiring experience in diagnosing and treating oral affections, combined with dexterity and skill in the use of instruments; and when at a loss what to do with trying cases, having at hand experienced demonstrators ready and willing to explain and show how difficulties are to be overcome. Such a plan as this has been pursued with the most successful results for years by the dental colleges, and those who

have taken advantage of all the opportunities afforded them for clinical practice in large cities frequently have attained, in the course of the sessions, remarkable skill. This, however, cannot be acquired by merely watching the efforts of others. No one ever learned to be an operator in that way. And it matters not how skillful and experienced instructors may be, he who desires to excel must teach himself. Preceptors may impart to him the general principles in the treatment of diseased action, and upon which all operations should be performed, and demonstrate the same to him; but, to acquire dexterity and skill, it is necessary that he should take advantage of every opportunity for practice. It is not an unusual thing for students, who have succeeded in performing a few creditable operations, to suppose that they can do as well or better at any future time, and that it is not necessary to work unless they are well paid for it. No more fallacious or unfortunate idea than this could possibly enter the mind of a student or young practitioner. Musicians recognize the fact that constant practice is demanded on their part not only for the purpose of improvement, but also to retain that which had been acquired at the cost of much time and trouble. The same thing is true of operative dentistry; and the response of Demosthenes in relation to what constitutes success in oratory, "action! action! action!" may be applied with equal force to it. Not a day should be permitted to pass by without filling a tooth; and, when patients do not present themselves, by placing a tooth in a small hand-vice, the requisite practice for the hand can be secured.

Skill and dexterity are not the only qualities demanded on the part of operators, and it becomes the student to cultivate *delicacy of manipulation* at an early period as an *indispensable* requisite. Those who recognize this fact, and have witnessed at the clinics held in connection with the meetings of dental societies the rough and ungainly manner in which some prominent practitioners manipulate, who set themselves up as remarkable experts, and assert that their mode of operating and the results obtained cannot be equaled, will freely admit the necessity of frequent reference being made to this point.

Within the past year two of the dental colleges have added to the curriculum of instruction by the professors and demonstrators a corps of clinical teachers, selecting for the purpose a number of gentlemen most of whom are well known to the profession as able operators, and some of them as frequent contributors to the literature of the profession. The benefits arising from an arrangement such as this to the students are unquestionable, if all that is promised should be successfully carried out. From the fact, however, that some of the gentlemen named live in cities at a considerable distance from the locations of the institutions, contingencies may occur to prevent the fulfillment of the engagements on their part; thus, the claims of business, sickness, and other causes might unexpectedly arise as insuperable barriers, and in this way inducements held out to

the students, if not fulfilled, would react prejudicially upon those who offer them. Such disappointments may not occur, but, as the possibility must be apparent to every one, care should be exercised to guard against them, for nothing is more to the advantage of any movement than to exceed the expectations raised with regard to it, and nothing more damaging than when, on being tested, it is found to fall short of the mark. Again, even admitting that all the gentlemen fulfill their appointments for the approaching session, is it reasonable to infer, when taking into consideration traveling expenses, the loss attendant upon absence from home on account of the cessation of practice, and other matters, that, however great their devotion to the interests of the profession may be, they can be expected to do the same thing year after year?

In the establishment of collegiate institutions, durability in the internal arrangements is one of the most essential elements of usefulness and success, and constant change is calculated to impair the first and endanger the last. Under such circumstances, it would be far better, in the appointment of clinical instructors, to secure if possible the services of practitioners residing in the cities where the institutions are located. An important, if not the primary object in selecting prominent gentlemen in different sections of the country for such positions, is, no doubt, to secure a *focalization* of influence from various quarters in behalf of the institutions with which they are associated. Permanent success, however, in the end is dependent upon the *support* of the many rather than the *influence* of the few, and the institutions which carry out to the fullest extent possible the programme best calculated to meet the demands of the age, will without doubt receive due encouragement and support from the profession.

PROFESSIONAL FEES.

BY E. N. HARRIS, D.D.S., OF BOSTON.

An Essay read before the Massachusetts Dental Society, June 4, 1866, and, by request, read before the Connecticut Valley Dental Association, June 5, 1866.

Mr. President and my Professional Brothers: I would invite your attention this evening to a few thoughts upon Professional Fees, a subject that is interwoven with the practice of dental surgery; and I think, amid the many different subjects connected with the advancement of dentistry that have been written upon and debated, this has not received the share of attention which its importance demands.

I make use of the word *fee*, as it is the appropriate term to express the compensation, remuneration, or acknowledgment received for professional services, in contradistinction to the *wages* of the craftsman or the day laborer, and the *prices* of commodities.

This word fee signifies something more than the amount of money

received for our dental operations; it means appreciation of our skill and a tribute to our talent, a reward for the faithful services which have conferred a lasting benefit upon our patients.

People speak of the *price* of provisions, hardware, and other commodities, *wages* of laborers, *salaries* of judges, teachers, and clerks, and *fees* of lawyers, physicians, and frequently of dentists. There are some persons who go round among practitioners trying the "market," to obtain the *prices* for filling teeth and inserting teeth; and others want to let themselves and families out by *contract* to the dentist who will do the whole "job" *the quickest and cheapest.* Now, the members of this society—myself included—believe that compensation for operations upon the sensitive and wonderful human organization, the noblest work of God, does not come under the head of market prices, and is not a proper subject for contracts.

As we are members of an enlightened, liberal, and rising profession, we will make use of professional terms in our language to one another, and to our students and to the public. I am not disposed to be a critic, or to place myself in the attitude of an instructor to my professional brethren, but I do like to see the right things in the right places, and I believe, as all dentists should, in the *fitness* of things. For instance, fees instead of prices,—profession instead of trade,—practitioner, operator, or dentist, instead of workman,—patients instead of customers,—instruments instead of tools, instruments in the operating room, tools in the laboratory,—operation or specimen of work instead of job,—students instead of apprentices,—laboratory or mechanical department instead of workshop,—assistants in the laboratory instead of journeymen, posterior approximal surface or the back part of a tooth, instead of the backside of a tooth.

These ideas may seem unimportant to some; yet upon a moment's reflection you will all agree with me that there are dentists outside of us, both in the city and country, many of whom need improvement in this respect. I do not mean that in our interchange of ideas with one another and with our patients, we need to make any parade of learning. The usages of language make nice but suggestive distinctions, and I for one am willing and desirous to heed them, particularly as they seem so appropriate to our high calling.

The subject of dental fees was discussed in our society one evening a year or more ago, and that discussion, though very brief, has been attended with highly favorable results, for I know of several of our members, myself among the number, who soon after advanced their charges, and find that with their increasing experience and improvement in the quality of their operations, they can just as easily get the fees that they now charge as they could formerly get the lower rates; and I have no doubt they practice with more satisfaction to themselves and to their

patients than formerly, for large compensation is certainly a strong incentive to our best efforts. There may be other and nobler incentives, but I do not reckon poor pay as one of them.

The practice of one dentist underbidding another, cannot be too strongly deprecated. There is a great deal of it done in Boston, and I suppose in other places. The man who underbids his neighbor for the sake of getting practice away from him, often injures himself seriously. For the public soon find out that he operates according to the *price* paid, and that he who cheapens his own labor, after awhile comes to be regarded as a *cheap* concern altogether. And there is no need of my saying what is well known to all of us, that the cheapest operations upon the teeth are the *dearest* in the end. The public are gradually finding this out, and are learning from the lessons of bitter experience that it is mutually for the interest of the dentist and patient to have the pay liberal. If we wish the public to value our services we must first place some value upon them ourselves. The public will judge us very much as we judge ourselves. The custom of underbidding is degrading to the profession and detrimental to its progress. It is something that I despise, particularly in a professional man. Even an honest shoemaker or woodsawyer would scorn to underbid or underwork his neighbor for the sake of getting business away from him to the injury and discredit of his art. In dentistry that is always *cheapest* which is *best*. The first great duty of every member of the profession is to seek its highest elevation,—to stand up for its reputation.

We must not give our patients the impression that we regulate our fees for filling teeth altogether according to the amount of gold we use, but according to the time, skill, and knowledge required to faithfully complete the operation; or in other words, give them to understand emphatically, if necessary, that the gold is merely a means we use to accomplish an end, and that we base our claims for remuneration upon the *services* rendered. It is not the number of dental operations for which we should charge, but for the professional services. I do not make use of the term dental operations in making out my bills, I say, "Dr. for professional services," or dental services, if you prefer, and under that line or heading I give a statement of the different operations with the fees for each.

In making our charges, we must take into consideration the disposition of the patient and the locality of the cavities to be filled, their accessibility and shape, and the trial of mind and muscle which we are sometimes obliged to undergo to keep the cavities dry. And in cases of nervous or unreasonable patients, the amount of sympathy, patience, and perseverance we have had to exercise. In some cases, that all of us occasionally meet, where the patient is inclined to be refractory and unreasonable, I have told them that I should have to charge them accord-

ing to the time they consumed. I have then observed a change in their tactics rather tending to more quietness in their general demeanor and movements. A recent dental writer observes, from his experience with patients, that he considers intelligence of this sort, communicated in a firm but gentlemanly manner, one of the best obtunders of sensitive dentine.

Considering these points, it seems to me difficult to inform a patient before commencing the operation what the exact amount of the fee will be.

Professional services admit of no positive regulation as to establishing a uniform rate of fees among practitioners; although I should think it would be well for the different dental societies to take this subject into consideration, and by unity of action inaugurate some system which would bring about more uniformity in the rates of fees charged by dentists, as you are aware that our profession goes beyond any other in the great variety and wide diversity of its fees.

The only true standard to be governed by is qualification, skill, and ability. Our charges for our services should be in proportion to our skill. High talent implies the cost of previous education and experience in practice, earnest application, self-denial, improvement of time, an abiding reverence for God and the Christian religion; all of these combined, develop eminent attainments and lead to high professional and private worth, which is sure to bring with it large fees and a liberal remuneration, paid, too, with appreciative respect as the acknowledgment of the highest services and most lasting benefits.

We cannot, therefore, fix upon a universal fee bill among dentists, as the whole matter of compensation (in the language of an eminent dentist, now deceased) "stands upon a sliding scale of remunerating adaptations," and must be governed by the ability and qualifications of practitioners in the different spheres of practice. These, I believe, are the only correct principles that can regulate it safely. I think, however, that it would be advisable for us, as a society, to discuss the propriety of establishing a table of fees for our government, making it obligatory upon the members to not go a whit below the fees fixed upon by the society, except in cases of charity or complimentary generosity, but permitting them to charge as much higher as they may see fit. Some such arrangement as this might be of advantage to all of us. Among the variety of fees now charged, we could fix upon a medium tariff between the minimum and maximum rates. We should thus begin the work of reformation in reference to dental fees, at least in New England, and in this way advance the interests and dignity of the profession. Would it not be wise for us to make this a subject of reflection and discussion?

(To be continued.)

PROF. O. W. HOLMES' MICROSCOPE.

The following extract from the Proceedings of the Essex Institute was placed in my hands by Prof. Holmes whilst in Boston recently. Having had frequent opportunities of examining a large number of microscopical specimens under his instrument, and thus testing its qualities, I commend it as one of the most simple, ingenious, and inexpensive instruments that can be procured for microscopical research. J. H. M'Q.

A meeting of the Essex Institute, Salem, Mass., was held Tuesday, May 1, 1866, to bring together all the microscopes which could be conveniently obtained, for the purpose of interesting the friends of the Institute in this department of science; also to celebrate, in an appropriate manner, the ancient festival of the first of May.

The meeting proved a decided success, over three hundred members and their friends being present, besides a number of invited guests, among whom were Prof. O. W. Holmes, of Boston; Dr. A. A. Gould, Vice-President of the Boston Society of Natural History, and others.

Prof. O. W. Holmes, on being introduced, briefly pointed out the distinction between the simple and the compound microscope, and describing the method by which the imperfections of the latter have been remedied within the last forty years, he proceeded to speak of the more remarkable improvements it has received at the hands of American opticians and philosophers.

1. Enlargement of the angle of aperture. In 1852 Mr. Quekett said in his well-known treatise, quoting Mr. Andrew Ross, the most famous of London makers of microscopes, that 135° was the largest angular pencil which could be passed through a microscopic object-glass. But long before this an American optician had made a $\frac{1}{12}$ object-glass having an angular aperture of 146°, the same glass which he now held in his hand. Since that time the same maker has made glasses with an angular aperture thirty degrees and more larger than this. Mr. Webb will show you in connection with his beautiful binocular a glass having an angle of 178°, which, as he says, and as we should expect, is equal to the resolution of the most difficult tests.

This audacious American, who carried the angle of aperture more than forty degrees beyond the limits of the possible (according to the highest English authority), was Mr. Charles Spencer, of Canastota, a small town in the midst of half-burned stumps of the forest in the interior of the State of New York.

2. Next on the list of American inventions and improvements, comes the inverted microscope of Dr. J. Lawrence Smith, of Louisiana, a form of instrument universally approved and very widely adopted by chemists as particularly fitted for their investigations.

3. The binocular microscope of Professor Riddell, of New Orleans, which, variously improved and modified, is now extensively employed both in England and on the continent, as well as in this country.

4. Tolles' binocular eye-piece, which bids fair to supersede the double body heretofore used.

5. The objective mirror, if we may so call it, of Professor Hamilton Smith, which most of us know only by report as yet, but which promises to do for the highest powers what the "Lieberkuhn" does for the lower ones.

The best known American microscope makers are Mr. Spencer, the pioneer among them, whose inventive genius has stimulated the opticians of the Old World to attempt feats which they considered impossible until he showed they could be and had been done; Mr. Tolles, his worthy successor, whose glasses challenge competition with any in the world; Mr. Wales, not so long known among us, but making first-rate objectives; Mr. Grünow, whose instruments of moderate cost are perhaps the best the American student can buy, and who can make excellent microscopes of costlier pattern when required; Mr. Zentmayer, whose stands are equal, if not superior, in elegance and workmanship to the finest of European make.

Dr. Holmes next proceeded to speak of microscopic photography. He referred to the very remarkable photographs made by Dr. John Dean, of Boston, from his own sections of the spinal cord.

He then showed some specimens of the art sent him a week or two since by Dr. Woodward, in charge of the medical department of the Army Museum at Washington. These micro-photographs, made by Dr. Edward Curtis, are the most extraordinary in many respects Dr. Holmes had ever seen. The object chosen was the well-known test *Pleurosigma angulatum.* Two negatives were taken, one with a $\frac{1}{8}$ and amplifier made by Wales, the other with a $\frac{1}{50}$ of Powell and Lealand. Each of these gave an enlargement of more than two thousand diameters. An enlarged copy of these gave them over nineteen thousand diameters. The spots of the diatom thus magnified are $\frac{3}{8}$ of an inch in diameter, perfectly sharp in outline, circular in form, but appearing as if they were hexagonal when looked at from a distance.

Dr. Holmes then said that, at the risk of taxing the powers of belief of those before him, he would attempt to give some idea of what is meant by an enlargement of twenty thousand diameters, within a fraction of which these objects are amplified.

It means that their surface, or that portion of it which you see, looks four hundred million times as large as it really is.

If your thumb nail were thus magnified, it would cover eighteen acres of ground.

A fly, weighing one grain, thus magnified in surface and in like pro-

portion in thickness, so as to keep his proper figure, if his weight increased at the same rate as his bulk, would weigh as much as a million horses rolled into one great monster horse.

A man weighs a million grains, and magnified in each dimension, as much as these dots are enlarged, would weigh as much as a billion horses; more very probably than ever lived on this planet, from the Adam of horseflesh to the present time.

Many who are here this evening remember the famous moon-hoax of Richard Adams Locke. It seems not impossible that the fancy of enlarging telescopic images by the microscope so as to bring out details upon the surface of the satellite may yet be realized. If the moon looks about a foot in diameter, it would, if enlarged as these dots are enlarged, be extended to nearly four miles in diameter, say, if you will, $\frac{1}{600}$ of its actual diameter. This would give us pictures of everything on the scale of one inch to fifty feet, and would show us men and women, if such there were on the moon's surface, as exceedingly interesting little animals of about the size of certain insects held in small esteem by the human species, and very easily seen as well as felt.

Errors excepted, of course, in the above calculations, which are believed, however, to be essentially correct.

Dr. Holmes then said that he had been particularly requested to bring with him the microscope which he is in the habit of using, the mechanical arrangements of which are of his own contrivance. The glasses shown in connection with it were a $\frac{1}{2}$, a $\frac{1}{4}$, and a $\frac{1}{12}$, made by Spencer.

The principal points in the simple and inexpensive arrangement to which he called attention were the following:

1. Fixed wooden stand, carrying with it lamp for direct illumination, objectives, eye-glasses, and other apparatus.

2. Tube supported on two forks cut in the wood; inclined at an angle of 35°; rotated by turning the shade-disk, which is 8 inches in diameter, and thus regulating the focal distance by the movement of a brass check which bears against an inclined surface of glass, giving a rapid and medium adjustment.

3. Delicate secondary adjustment, by a screw with scalloped head, placed close to the thumb which with the forefinger moves the object stage. This screw depresses very slightly one of two brass plates, fixed to object stage, against which the glass object slide is pressed forward by two small springs. This arrangement has the incidental advantages of bringing all objects to the same level, and of affording protection to the thin glass of the slide.

4. Horseshoe magnet for fixed stage.

5. Object stage of soft iron, 8 inches long, 1 inch and $\frac{1}{4}$ wide, adhering to fixed stage by attraction, assisted by brass spring at one end, loaded to keep it down, moves horizontally by sliding over an edge $\frac{3}{4}$ of an inch

to the left of middle of fixed stage, and up and down in the arc of a circle of which this edge is the centre. Requires but one hand for management, which hand is always in position to command the fine adjustment.

6. Achromatic condenser (or any other piece of apparatus) slides in between the branches of the horseshoe magnet. The diaphragm is directly behind the achromatic condenser.

7. A small plano-convex lens occupies one hole of the diaphragm, and is very useful in concentrating the rays of oblique light when that is used.

8. Although this instrument is arranged chiefly with reference to using the direct rays of a lamp without any reflection, a mirror can be substituted for the lamp if desired. The following is Dr. Holmes' method of arranging this adjunct. A plano-convex lens is set in a frame, to be used as a condenser. Two plane mirrors of the same size are cemented back to back. This double mirror fits against the plane side of the lens, thus giving a plane mirror on one side and the equivalent of a concave mirror on the other.

9. Dr. Holmes employs a simple *indicator*, made by sticking a portion of a fine needle to the diaphragm of the eye-glass with a bit of wax. This is a great convenience in demonstrations, it being easy to bring any particular object of examination to the point of the needle by moving the stage.

10. A very convenient complement of the instrument here shown is the simple arrangement shown by Quekett (fig. 257, 2d edition), which is especially adapted for very low powers, for dissecting, examining the circulation, etc.

Dr. Holmes said he would take occasion to mention a plan he had lately adopted for preserving recent preparations of soft tissues so that they could be shown day after day. It is simply laying them on a wet cloth, which is itself placed on a sheet of India-rubber cloth, and covering them with a bell-glass. The air being soon saturated with moisture, the preparations cannot dry.

He then exhibited one of Mr. Lockhart Clarke's sections of the spinal cord, and a single nerve-cell isolated and stained with carmine, prepared by Gerlach, both of which were lent him by Dr. Dean, to whom they were presented by the distinguished anatomists of whose skill they are singularly perfect specimens.

NECROSIS OF ALVEOLAR PROCESSES, AND TREATMENT.

BY W. H. ATKINSON, M.D., NEW YORK.

This, like every other disease, has its inception, culmination, and decadence.

All three stages must have been pronounced in considerable degree, before it is possible to diagnose the case as an unmistakable necrosis of

the alveolar processes. If we wish to get a clear conception of necrosis, distinct from its after-consequences or contingent effects, it becomes necessary for us to understand the mode of healthy nutrition of these bones.

The whole process of nutrient activity is only an alternate or conjoint predominance of integrative and disintegrative movements among the histological elements of the human (or other animal) body.

Wherever the first holds the reign, normal growth, in continual increase to full development of every part, obtains to the full measure of satisfaction of type. At this point, ripeness of molecule and cell induces, in natural serial order, the disintegrative decadence, without which there is no health of the body. And thus the worn-out material of which tissues are formed, is dissolved and sent out of the way into the excretory channels with any excess of pabulum present above the need of the part. (This is legitimate concurrent jurisdiction. But wherever disintegrative movement gets exclusive control, necrosis [death] is expressed in the exact ratio of that predominance, whether it be in molecule, cell-tissue, organ, or the whole body.)

The blocking up or obstruction of these channels in any way prevents the exit of these now effete, broken-down dissolving bodies. And being retained within the system, they become poisonous, or they generate a poisonous presence, which extends into territories of healthy cells, causing death, necrosis of these little bodies.

Here, then, lies the key to the extent of necrosis, viz., in just so far as obstruction is effected to that extent we have necrosis.

There are two important points of obstruction, viz., channels of supply of pabulum, and channels for removal of the excess of pabulum and effete matters out of the system.

In medicine and surgery, as in morals, a wrong action should be righted at the earliest possible moment. Necrosis of small territories of the alveolar processes, resultant upon inconsiderable obstructions, become points of departure for malign influences which involve greater and greater extents of area of tissues, till they attract the attention of the patient; when, if he be intelligent, he will set about correcting the derangement by promptly putting it under treatment.

The treatment of dead and dying alveolar processes consists in prophylactic and curative means. Prompt removal of the dead parts becomes the proper prophylaxis for those not yet under the dominion of the condition properly denominated necrosis. The old plan of waiting for separation to take place by the ulcerative process isolating the necrosed bone, always involves needless loss of the soft parts, out of which we desire to grow the new processes, or of which our pocket to hold the plasm is made.

In good constitutions, old necrosed processes have been tolerated for month after month, running into years in some cases. I have treated

several which had carried necrosed processes, one, two, and three years after they should have been removed, and new ones formed as good as the originals, whose place they ought to have taken, and whose duty of holding firmly in place teeth with living (and dead) pulps they are fully competent to perform; defying the sharpest surgical scrutiny to differentiate them from the bones whose place they so admirably fill. *Removal* of dead tissue is the only possible cure for necrosis. It is evident, then, that so soon as even a single cell is necrosed, prompt removal would arrest any further spread of the work of this discordant member of the body politic among cells, and then we should never have any case of small circumscribed necrosis upon which to exert our skill in curing in obedience to physical law. Ignorance on the part of the surgeon, and fear on that of the patient combined, have tended to the destruction of alveolar processes by necrosis, to needless extent.

Free incisions along the course of the seat of inflammation or obstruction will in every case countervail the further progress of the case for the time. And then correct constitutional treatment will do the rest.

Two forms of obstruction present themselves to us causing necrosis of the alveolar processes, viz., simple mechanical obstruction (which divides into two forms—1. Emboli, and 2. External mechanical pressure); and derangements of the blood crasis—blood poisons. Here, again, simple removal is the certain cure.

But how are we to remove these obstructions? By first recognizing them, which of itself will suggest at once the best methods within the range of our knowledge of such matters.

For purely local mischief, let local remedies be resorted to. And for constitutional cachexia, a correct regimen, with well-advised internal remedies, may be relied on with a confidence that will be crowned with success and satisfaction in—shall I say every case? Yes, I will dare to say in every case that is faithfully observed, undertaken, and treated in the light and knowledge now extant.

To sum up, then,—treat all incipient cases by incisions bold, deep, and plentiful, all along the bases of the processes, avoiding cutting the free margins of the gums, lest the "dentium ligamentum" be severed. A thing no judicious dental surgeon will ever do or permit to be done in cases where it is desirable to retain the teeth.

Avoid the incisive plexus of vessels behind the central incisors and the venous sinus along the junction of the internal alveolar process and the palatal process of the superior maxilla, and you can scarcely do mischief by cutting the gums and periosteum clean through into the bony tissue of these dense processes.

Promote the disgorgement of the severed vessels by a free use of warm water. After the bleeding is staunched, rinse the mouth repeatedly with tinct. arnica and water, two parts of the former to 100 of the latter.

Unless the case be very stubborn or too far advanced, you will not need to repeat the treatment. When any cognizable portion of the process is actually dead (deprived of blood), carefully enucleate the dead and dying portions by peeling off with a spud (a dull, smooth, flattish burnisher) the soft parts (periosteum and gum) to the limit of privation of blood, and then remove with chisel, file, or rasp, or other convenient instrument, all that part of the dense or cancellous bone deprived of circulation, until the florid blood and the elastic living feel of the bone under the instrument informs you that the healthy bone territory has been invaded. Better remove a little more, than any less than is necessary. For if you nicely remove, by warm-water washings and tinct. of arnica and water lavements, all the debris of the file, rasp, etc. etc., the treatment will be so short, simple, and satisfactory, that doubt may be entertained whether the operation after all had been necessary for the restoration of the parts to health!

Such is true surgical success as to excite astonishment, opposition, and disbelief in all but the earnest, honest mind, be he patient or practitioner.

MICROSCOPY OF THE TEETH.

BY S. P. CUTLER, M.D., D.D.S., HOLLY SPRINGS, MISS.

(Continued from page 123.)

From the sides of the pulp cavity the tubuli leave nearly at right angles, but soon after leaving the cavity they begin to curve upward for a certain distance, then mounting upward and outward for a given distance, they continue in a more or less direct line or straight course; then commence and curve outward just before reaching the enamel, or just before the tubuli branch or bifurcate this second curve, nearly corresponding to the primary curve, the two curves forming a perfect O G. figure. The inner curve is generally more sudden than the outer curve. The outer curve is generally longer, sometimes the reverse. These curves are generally very regular. Where the tubes are longest, the largest O. G., and where shortest, the shortest figure.

In some instances the secondary curve commences where the first one leaves off—that is, where the distance is least from point to point, and where longest there is considerable space where the tubes are straight between the primary and secondary curves.

At some points there is a minor curve upward just at or before entering the enamel; this is oftener seen in the molars just below the cusps than anywhere else.

All around the cornu or horn of the pulp, whether it be in teeth that have four or only one cusp, the tubuli, after leaving the cavity, suddenly curve upward, and continue upward in a parallel course or nearly so with those that leave the cavity directly over the tip, and of course, as before

stated, forming in case of side tubes the O. G. These are generally the longest of any tubuli. The tubuli in the grinding surface of molars are already described in the above explanation, which will readily be understood by studying the form of a molar.

The above equally applies to incisors, cuspidati, and bicuspids,—one explanation applies to all.

The tubuli from the sides of the nerve cavity in the neck mount upward, and most of them reach the enamel.

The object of this seems to be to bring all that can possibly be brought in contact with the enamel and to fill up and occupy the crown of the tooth.

This explanation accounts for the curvatures of the tubuli. Should these tubuli all pass directly out at right angles in a direct course to the neck of the tooth, a more extensive branching of tubuli would be requisite to fill up completely all portions of the crown substance which would at the same time give an undue amount of sensibility to the neck of the tooth which is not protected equally by enamel, and would be more likely to give trouble. The above reasons and explanations may not be beyond criticism, but will probably be received and adopted by the profession until better ones are brought forward to take their place.

The tubuli are hollow tubes open at one end and closed at the other, without any valvular or any other apparent obstruction during their whole course. These tubuli continue the same size from nerve cavity to the point where the first branch leads off, and from that point to the next branch both branches are of equal size, and these branches just half the size or capacity of the tubuli up to that point, and so from nerve cavity to enamel, wherever branching takes place, and where there is no branching there is no diminution in tubuli.

Where the tubuli are strictly parallel in adult teeth, no primary branching or bifurcations are to be found. Neither is there any gradual taper discoverable like a tree, as I see represented in the DENTAL COSMOS from a drawing by Prof. Leidy.* The branchings in the primary tubuli are generally simple bifurcations; in some instances, however, three forks are discoverable at precisely the same point, though not frequent only at their terminal branching. These three branches, where they exist, have the capacity of the trunk that formed them as before stated.

The system of tubuli cannot be regarded as exclusively dichotomous, as stated by microscopists, but a mixed one of both di- and trichotomous both in their general and terminal branchings.

The tubuli are apparently in specimens where two or more thicknesses are left, regular even lines, but on thinning the specimens to a solitary thickness they are found to be full of short, irregular crooks, during their

* The illustration objected to, as a *diagram*, is in general accordance with *nature*, and the illustrations presented in the works of Retzius, Nasmyth, Tomes, etc.—J. H. M'Q.

whole course. These short crooks are more apparent under high powers. Notwithstanding the tubuli are full of short irregular crooks, they never at any point in their course touch each other or come in contact.

The object of branching of the tubules seems to be to fill up space where there is divergence.

The surface of the nerve cavity being smaller than the surface of the tooth, there must necessarily be more or less branching in order to make the intertubular spaces about equal throughout, otherwise there would be a greater predominance in the intertubular spaces toward the circumference.

Just before the tubules enter the membrane that exists between the enamel and dentine they, every solitary one of them, branch or bifurcate, and in many instances trifurcate ; the sum of the capacity of these branches, as already stated, being just equal to the trunk that formed them. These branches diverge generally at an angle between 50° and 75°, and cross each other in different directions as they enter the membrane which might be denominated coronal or inter-enamel membrane. The terminal branchings of tubuli form a universal delta just before entering the enamel, and when taken collectively form a beautiful coronal arch.

The intertubular spaces, or the spaces between the tubes, are greater than the diameter of the tubes,—in other words, double the number of tubes could occupy the same spaces without actually coming in contact. There seems to be no regularity in the tubular passage through the intertubular spaces.

(To be continued.)

ON THE USE OF SPIDER'S WEB AS A STYPTIC.

BY ABR. ROBERTSON, WHEELING, VA.

On one or two former occasions I have written something on the use of the spider's web as a styptic in cases of excessive hæmorrhage after extracting a tooth. I now wish to add the result of my experience in another case. I do it with the hope and belief that it may be an essential service to some of my professional brethren, and perhaps to some of their patients. It may be thus serviceable on two accounts. First, it can always be obtained, and everywhere, and sometimes when other more popular remedies cannot so readily be obtained; and second, because in my hands it has proved efficient where everything else has failed.

About a year ago a young man, about eighteen years of age, came to my office to have a lower molar tooth extracted. I examined the tooth, took my forceps and extracted. The operation required rather less force than usual. The tooth came out entire, and clean, and with no laceration of surrounding parts, except the necessary severing of the periosteum. But from the first blood flowed more freely than usual. I directed my patient to rinse his mouth with cold water, which he did

considerably longer than the usual time of the flow of blood in such cases, but with no diminution of its flow. I then applied tannin on pledgets of moistened cotton, filling the socket with them. After repeating this application two or three times, the bleeding ceased, and he left. In about three hours after he returned, bleeding as profusely as ever. I then filled the socket from whence the tooth came with cotton saturated with perchloride of iron. This I repeated several times, with a delay of a few minutes between the applications, without any apparent effect. I next applied the persulphate of iron, full strength, in the same manner, and with no better result. Finally, I procured some spider's web, with which I filled the socket, as I had before done with the cotton, when—I need not say that I was gratified to see—the bleeding stopped almost immediately, and there was no more recurrence of it.

THE ANAESTHETIC SPRAY PRODUCER.

BY W. H. WAITE, D.D.S., LIVERPOOL, ENGLAND.

EXTENDED acquaintance with this ingenious apparatus serves to increase the conviction of its usefulness as an alleviator of pain in the much dreaded operation of removing teeth. Some inconvenience was at first experienced through cramping of the hand in working the bellows. This has, however, been overcome by the adjustment of a small foot bellows, which can be easily and comfortably managed by the operator without the aid of an assistant.*

The result of a large number of cases, which have come under my personal notice, may be briefly stated thus: Ninety per cent. of the extractions which present may, by means of the anæsthetic spray producer, be performed with such care as to remove all dread from the minds of patients with regard to future operations of the same kind. Such an invention justly demands some consideration and trial at the hands of all whose duties compel them at times to inflict pain upon their fellow-creatures.

Dr. Richardson, of London, the eminent inventor of this instrument, has conferred a boon upon suffering humanity, and upon all branches of the surgical profession, which is likely to prove scarcely second to the advantages derived from the kindred discovery of Dr. Horace Wells.

The risk attendant upon the administration of chloroform or ether, and the unpleasantness which frequently arises from the inhalation of nitrous oxide, need not be incurred, save perhaps in very rare instances, in order to secure the tolerably painless removal of diseased teeth. *Pure* ether, gradual (as regards force) but direct application, and promptness in operating, appear to be the principal requisites for average success.

* DR. S. S. WHITE has been furnished with a minute description of the above arrangement.

From sixty to ninety seconds would seem to be the average time for applying the spray. Blanching of the gums is by no means an invariable result; but where it occurs, it may be interpreted as a signal for applying the forceps. Patient inquiry will, however, in this instance, as in many others, be fully rewarded, and, unless experiments upon the teeth of the New World differ very widely from those on the teeth of the Old World, those of my brethren who make acquaintance with the anæsthetic spray producer will desire and obtain such an intimate friendship with the instrument as will make it their daily companion.

REPORT OF TREATMENT OF EXPOSED PULPS AND ALVEOLAR ABSCESS.—No. 2.

BY J. S. LATIMER, D.D.S., NEW YORK.

In the Dental Cosmos for December, 1865, is published report No. 1, which included all my recorded cases up to July, 1865. This report includes that and adds another year. It stands thus:

Whole number of cases recorded	218
For Males	71
" Females	147
Treatment of Incisors and Cuspids	61
" of Bicuspids	80
" of First Molars	39
" of Second "	24
" of Third "	14
With living Pulps	129
Devitalized Pulps with Arsenious Acid	119
Arsenic failed and I extirpated (patient anæsthetized)	10
" gave pain in	45
" gave no pain in	84
Pulp removed perfectly	54
" " imperfectly	65
Required treatment subsequently	7
Cases went by default, patient not attending	25
With peridental membrane inflamed	89
Minimum number of dressings	1
Maximum	30
Average	8
Required treatment after supposed cure	1
Cases went by default of patient	16
Had fair opportunity and failed	3

It will be noticed that less than half the pulps removed were perfectly extirpated. This may seem strange to some; but it should be remembered that only within a few months have I been provided with suitable broaches; and, even now, it is often impossible to remove the entire pulp from flattened and curved roots.

In the treatment of both pulps and abscess, I have had the most trouble with persons having sluggish livers. They are generally more or less sallow and often troubled with constipation. I leave the arsenical paste in teeth from one to three days, and generally remove the pulp about ten days after the application.

When the paste is applied directly to the pulp, and especially when the pulp has been punctured, the medicine causes little or no pain; but it is not always possible to so apply it.

In the treatment of abscess, I have relied mainly on iodine and creosote inclosed in the teeth and permitted to act homœopathically through the foramina. Where fistulous openings are present, the treatment is through them as well as the dental canals. Probably every one who has attempted the treatment of teeth with diseased peridental membranes, has noticed that where there is no fistulous opening, great care must be exercised to prevent inflammation from being set up by pneumatic pressure produced by forcing air or other substances through the foramen. Even after extended treatment, this difficulty will sometimes embarrass us. I have overcome this obstacle in some instances by carrying a very few fibres of dry cotton to the vicinity of the foramen on an exceedingly fine broach, moving it slowly up, so that the air in the canal would have opportunity to escape between the fibres. A second dry piece would be carried up in the same manner, and packed well; then a third piece, with the addition of creosote, is added, after which I fill the balance with gold wound upon broaches—the broach serving to assist in getting the gold well into the canal, after doing which it is withdrawn from the little pointed cylinder or cone. Each cone is condensed before another is added.

SURGICAL EDUCATION.

A Communication read before the Association of the Colleges of Dentistry, at a meeting held in Philadelphia, Oct. 17, 1866.

BY JAS. E. GARRETSON, M.D., D.D.S.,
LECTURER ON CLINICAL SURGERY IN THE PHILADELPHIA DENTAL COLLEGE.

Gentlemen: For the first time in the history of the profession, a gathering of representatives from the faculties of all the dental colleges in the United States has been convened together in formal consultation. Such a meeting will strike us all as being the one best adapted to study the graver interests of the profession. To a matter of such import I have the honor to-day to invite your best attention.

The intelligence of the world is progressing. The schoolboy of to-day discourses on anatomy, and the schoolmiss propounds questions in physiology. The general and common judgment of mankind is ripening, and this ripeness of judgment is giving proper names and positions to all things.

I beg therefore to suggest to you that a period has now arrived when

the conviction is forced upon us that this intelligence, as exhibited both in and out of the dental profession, demands and compels that, for the support of the doctorate assumed by the dentist, the greatest change must be effected in the matters of his education and duties; for his present scientific attainments and sphere of duties are too restricted. The proofs being—

1st. That graduates of dental colleges manifest to the world their inability to treat any disease outside of those associated with a few simple semi-vital organs, and which diseases require for treatment much more the skill of a mechanician than that which the world recognizes as a doctor.

2d. That their attainments are understood by the community to be not of the same general character as that of other regular specialists, proven by the fact that, while all other specialists are understood as being proper doctors, and so received and consulted, the dentist is not.

As far as one of the colleges of this Association is concerned, I have the great pleasure in witnessing these facts fully recognized. This college, by a decided change in its curriculum, stands to-day before the world as a college of surgery, assuming the position that its graduates are to have a wider field of work open to them; a field which shall signify and demand attainments the character of which must, under all circumstances, and with all classes of persons, professional and otherwise, stamp their entire equality with any and all medical practitioners; give proper and manly position to the specialty, and make it of such character that the best and wisest may feel honored by connection with it.

This enlarged sphere consists in the conversion of the present specialty into that of Oral Surgery. To this end, the student entering this school has offered to him every advantage in the way of the study of general surgery that is presented in any university or college in the country. Dissections, clinical observations, attention on didactic and demonstrative discourses, are necessary to his obtaining the highest honors of the school, or of receiving its indorsement as an oral surgeon, such general study being accepted as absolutely necessary to the position assumed.

Qualified by such a course to meet the emergencies of general surgical practice, and as fully qualified according to his ability as he could elsewhere become, his studies continue with a more and more direct application to oral diseases, beginning with the teeth, and ending with the complexities of the subject.

This college, then, by what it has done and what it proposes to do, professes to present to the world its graduates as surgeons—surgeons by education, equal to any demand that emergencies may at any time make upon them, whether on the railway train, on the battle-field, or called hastily from the privacy of the office; yet presents its graduates as spe-

cialists, as a Tonybee is a specialist in aural surgery; as Fergusson is a specialist in oral surgery; as Dr. Hays is a specialist in ophthalmic surgery. More decided in the general restriction of practice than these gentlemen, true, but only because having so much to do in the way of the teeth; opportunity for other practice is by so much restricted. The specialty to mean to the community the treatment of every disease of the mouth and associate parts, just as ophthalmic surgery means to the community the treatment of the hundred diseases of the eye, its cavity, and associate parts. To mean to the community that its practitioners, as is understood of ophthalmic and other properly recognized specialties are amply prepared and trustworthy, from education, for any surgical service.

I beg respectfully to suggest, that the colleges represented by each faculty here present assume this new relation to the world, firmly believing, as I do, that thus a field will be opened which, for attractiveness and importance, shall be surpassed by none others in which men work for the good of their fellows.

WHO SHALL BE DENTISTS?

BY EDWARD DAY, WARREN, MASS.

This is a question that has been suggested by certain remarks of some of our brethren in the dental ranks, and I purpose to ask a few questions which I trust will not be considered invidious. In the first place, let me inquire who have been successful in the world? Have not men from different callings than those who have an acquaintance with the fine arts, and are accustomed to the manipulations of the brush, chisel, and graver, and from other circles than those whose lot was cast with the wealthy, the educated, the refined? Have not some of our ablest statesmen been from the carpenter's shop, the factory, and farm? Where and from what have some of our most brilliant and profound pulpit orators been called? I would not deprecate the idea that men from the circle of those who are skilled in the use of the pencil, brush, and sculptor's chisel have a far better preliminary training for the delicate manipulations of the dentist than those accustomed to "the heavier tools of mechanic arts." But would not such insinuations tend to keep some worthy men out of the dental profession?

I am far from being opposed to a high standard of education, and hope the standard never will be lowered, but that there will be a dental college in every large State, and that they may be supplied with good and efficient professors, and completely endowed, so that worthy young men who have not the advantages of those whose lot is cast with the before-mentioned privileged classes might graduate gratuitously. And I hope the time will soon come when there will be in the "Athens of America" such an institution, and that it may be filled with young men

who shall be made Doctors of Dental Surgery, and men in every particular worthy of respect and example.

In connection with the communication above, it may not be amiss to remark, that it is a well-recognized fact that the labors of the anvil, forge, and plow, along with the free, fresh air of the country, are eminently calculated to strengthen the frame and develop the muscles of man; and such training, combined with subsequent mental culture, by enlarging the sphere of intellect, it is reasonable to infer, has enabled some who have passed through such experiences, and eventually devoted themselves to professional life, to not only manage with ease large and engrossing practices, which would have killed men of weaker physical organisms, but also to attain marked distinction as writers and speakers. A notable illustration of this is presented in the case of Velpeau, the eminent French surgeon, professor and author, whose skill as a surgeon and popularity as a lecturer are only excelled by his voluminous contributions to medical science. The son of a blacksmith, his boyhood days were passed in attending on the forge and keeping his father's bellows in play. Every moment that he could secure from this laborious occupation at the period, however, was spent in learning how to read. Possessing a keen intellect, quick perception, retentive memory, a well-developed physical and mental organism, and indomitable energy and perseverance, he eventually reached a most elevated position as a man of science. Other instances might be mentioned of eminent professional men in different countries, and particularly our own, who have passed through similar experience; but this will suffice.

Fully recognizing that such an experience as that just referred to is by no means a proper training for professional life with ordinary minds, and that only persons of the most remarkable intellectual endowments could rise superior to such environments, in directing attention to these facts, the main object has been to demonstrate how much the mental powers of man are dependent on a well-developed physical organism, and to impress upon professional men the importance of not attempting to develop the intellect to the exclusion of all attention to physical training. Alexander Pope to the contrary notwithstanding, a sound body is necessary for a sound mind; and it is a fortunate circumstance that those to whom the instruction of our American youth is intrusted are at last beginning to recognize the importance of paying attention not only to the development of the minds, but also to the bodies of their pupils. The hours spent in the gymnasium, upon the river in rowing, and on the base ball ground, when kept within proper bounds, by the young men in our colleges and universities, will better prepare them for the busy actions of professional life, than if all their time had been rigidly and exclusively devoted to study.

The attention which the Greeks paid to physical development was remarkable, and well worthy of imitation; and it was not an unusual circumstance in the Olympic games for the athlete who bore off the palm in the races and other physical exercises to prove in addition victorious over other competitors in intellectual efforts. The activity of the German mind, which is exercising such a preponderating influence in our day, is no doubt largely due to the time spent by the German student in the gymnasium, and in long pedestrian tours, particularly in Alpine regions, where the mental powers are quickened and strengthened not only by the exercise of the body, but by the stimulating influences of new refreshing scenes. The exercise thus inaugurated in youth should be continued during life, if one desires to maintain perfect health, and develop to the fullest extent the mental capacities; and it is non-attention to this, and a general neglect of hygienic laws, rather than overwork, which causes the health of professional men frequently to break down under what others, who are more observant of the claims of nature, perform with ease and comfort.

Having dwelt on former occasions upon the importance of a *thorough* knowledge of anatomy, physiology, hygiene, chemistry, the principles of medicine and surgery, to fit one for the practice of our profession, it is not necessary to reiterate those remarks on this occasion. J. H. M'Q.

IMPROVED KEROSENE LAMP.

BY E. M. MORRISON, M.D., NOBLESVILLE, IND.

For some time past I have been using kerosene for vulcanizing in an improved lamp. My vulcanizer is one of Dr. Hayes' three-case boilers, and my lamp is such, I suppose, as is generally used, with an improvement which I have made upon it. I soon found an objection to the lamp as obtained from Mr. Leslie, of Cincinnati. It would become so hot while vulcanizing, that it would burn one's finger if touched. I had trouble with it, and regarded an explosion not improbable. The wicks did not support a regular flame, which was partly owing to their being too narrow; but the flame would occasionally flash up, and the evaporating oil, to some extent, would be deposited on the top of the lamp, thereby increasing the risk of an explosion, and producing smoke.

To obviate these difficulties, I had the bottom of the lamp taken off, and the rim perforated with a number of holes as large as its width would admit of. Tubes nearly an inch long were made to extend downward from the burners and receptacle for the oil. These tubes were firmly soldered to the under side of the top of the old lamp, so as to connect with and encircle the burners and receptacle. A new lamp was

then formed at the lower end of these tubes, to connect with them and the perforated rim, so that its top corresponded in position with the bottom of the old lamp, and the tubes extend through it at holes which corresponded with the holes in the old top supporting the burners. These tubes were soldered in this position before the bottom was put on. It will be seen, from this arrangement, that there is a diaphragm between the burners and the lamp, with free access of air beneath it. In this way the heat is cut off, so that it does not affect the lamp, and the troubles above enumerated are obviated almost entirely.

I now like this lamp better than the alcohol lamp. The heat is more easily controlled; there is no smoke, and but little of the offensive smell of coal oil. Besides all this, it is a great saving over alcohol, at present prices, the cost of vulcanizing with it being a mere trifle. I therefore cheerfully recommend its use to the profession, and hope the manufacturers of lamps may adopt the improvement substantially in principle.

DENTAL CARIES.

BY ELTON R. SMILIE, M.D., SAN FRANCISCO, CAL.

During the discussion of the New York Dental Society relative to the cause of caries in teeth (reported in the April number of the Dental Cosmos), Dr. Atkinson stated that the cause of caries embraced such a wide range, that it was impossible to treat it in a terse and aphoristic manner. But how he and the other members could escape conviction of the cause, in defiance of the evidence adduced by different speakers, of the immunity of Indians and islanders of the Pacific from carious teeth, when backed by the character of their food, which requires prolonged mastication, is beyond comprehension. Baron Humboldt, in speaking of the Caribs and other coast Indians, said that he was almost inclined to class them as ruminants, from the time occupied in the mastication of their food; at the same time testifies to the perfect beauty and soundness of their teeth.

I have visited and specially observed the trencher habits and customs of numerous tribes of Indians, both in North and South America, and in every instance where they adhered to their primitive food and cookery, I have found regular and sound teeth, with a pearly whiteness, secured by the friction of the natural dentifrice of tenacious food, slowly and thoroughly chewed, the liberated saliva washing away every adhesive particle, rendering the mouth far more pure and desirable for osculatory union than those of the most beautiful belles of your cities, with soup-clogged teeth, and breath charged with the fumes of fermentation and decay; and the contrary obtains wherever they have adopted the Euro-

pean hodge-podge style of preparation, that exempts the teeth from their inherent duties.

In addition, I will offer as instinctive evidence man's ruminating disposition. The native of India chews the betel nut, mixed with bang and lime; the Indians of South America cacao; while the more refined (?) and civilized natives of Europe and America chew the filthy weed, tobacco, the local effect of which upon the teeth is averted by mastication and the flow of saliva occasioned, although it does not fail to exhaust and vitiate the juices of the mouth. Each class of devotees to the quid,* whether of poisonous root, weed, or not, claim that they possess a preservative influence on the teeth, while in fact the exercise of the jaws and teeth enables them to resist the deleterious influence. Deprive the lower order of ruminating animals of their native pabulum, which requires with the cud almost constant chewing, and feed them with slops, the remnants from the tables of their human owners, and they will suffer invariably from carious teeth, with absorption of the gums and alveolar process.

Returning to the human species, we will compare the teeth of our farmers and backwoodsmen with those of the citizens of our large towns and cities, whose food is subject to the manipulations of a professional cook, and it will be found that in beauty, regularity, and even in cleanliness, without the aid of a brush, the teeth of the former are vastly superior. If the subject is traced with reason through all its complications, hereditary, etc., engendered by long-continued neglect, I am confident that the cause of caries will be found to reside mainly in the constantly increasing habit of denying the teeth the privilege of self-preservation, by superseding artificially the function of mastication. If we consider the formidable armature of the jaws—the teeth and powerful muscular aids for working the battery, they show conclusively that their function, so plainly indicated by nature, cannot be neglected with impunity, without impairing their own integrity, and by withholding the gustatory excitement necessary for the elimination and proper admixture of the glandular juices with the food, the subsequent organic functions required for the proper preparation and assimilation of the nutrient material would become perverted. Thus, it will require no great stretch of reasoning power to discover in excessive cookery and consequent neglect of the functions of the jaws and teeth, prolific cause of caries. The remedy will be found in the adoption of food that cannot be swallowed without being thoroughly bruised and separated by the action of the jaws and teeth.

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* Modification of "cud" by King James I., adapted to the introduction of tobacco.

PROCEEDINGS OF DENTAL SOCIETIES.

TRANSACTIONS OF THE AMERICAN DENTAL CONVENTION.

BY DR. W. C. HORNE, NEW YORK.

The twelfth annual meeting of the American Dental Convention was called to order by Dr. H. F. Bishop, the Vice-President, at Clinton Hall, New York, at noon of Tuesday, August 7th, 1866.

Dr. W. C. Horne, of New York, was elected secretary *pro tem.*

The minutes of the last meeting were read and approved.

A report was read from the Treasurer, showing a balance in hand of forty-five dollars.

The election of officers being next in order, Dr. W. H. Atkinson said he should like first to have it decided whether this Convention was to be kept up or to become obsolete.

Dr. B. W. Franklin scouted the idea of an adjournment *sine die;* he saw no signs of a collapse.

Dr. I. Woolworth had not supposed he was coming to a funeral.

Dr. J. D. Rich said when anybody talked of destroying the American Dental Convention he would be on hand to fight its battle. This Convention was formed to bring together men who would not otherwise meet. It was the first scientific convention for the exchange of opinion and advancement of the dental profession, the members of which did not fight among themselves. He believed it to be the desire of members of the American Dental Association to destroy this Convention.

Dr. W. H. Atkinson believed the sole object of the formation of the Association was to do good. The differences between the two bodies were of a constitutional character. He was willing that the Convention should live or die.

The election of officers was ordered; Drs. G. H. Perine and B. M. Gildea were appointed tellers.

The following gentlemen were declared duly elected:

President.—Dr. W. B. Hurd, of Williamsburg, L. I.

Vice-President.—Dr. J. G. Ambler, of New York.

Treasurer.—Dr. J. H. Smith, of New Haven.

Recording Secretary.—Dr. W. C. Horne, of New York.

Corresponding Secretary.—Dr. B. F. Arrington, of Wilmington, N. C.

The President elect was conducted to the Chair by Drs. Rich and Ambler; he returned thanks for the honor done him, and said he would endeavor to advance the objects of the Convention, and give every man his due in debate.

It was ordered that the sessions should extend from 10 A.M to 2 P.M., and from 7½ to 10 P.M.

On motion of Dr. Rich, it was resolved that no member should speak

longer than five minutes, nor more than once on any subject till all who desired to do so had had an opportunity of speaking.

The following committee was appointed to report subjects for discussion during the session, namely: Drs. B. W. Franklin, G. H. Perine, I. Forbes.

The Convention then adjourned to $7\frac{1}{2}$ P.M.

First Day.—*Evening Session.*

The Convention was called to order by the President. The minutes of the morning session were read and approved.

The Committee on Subjects for Discussion reported as follows:

1. Voluntary Papers pertaining to Dentistry.
2. Diseases of the Dental Pulp, Periosteum, and Contiguous Soft Tissues.
3. Mechanical Dentistry.
4. Causes and Treatment of Caries.
5. Dental Education.
6. Miscellaneous Subjects.

The Committee recommended that half an hour should be set apart at the opening of each session for the exhibition of improvements in dental mechanics.

The report was adopted.

No papers being offered, the second subject was taken up.

Dr. C. F. Butler referred to an operation introduced by Dr. Allport two years ago, which he designated as pulp surgery. It consisted in the excision of a portion of the dental pulp, which required extreme delicacy, and would not be likely to succeed in the hands of bunglers; the cases must be selected with care, and if success were attained in one in ten it would be worth all the effort it had cost. Where the dental pulp is exposed and easy of access, cut off a portion of it and touch the part with crystals of carbolic acid, which on deliquescing would leave an eschar; the cavity to be filled temporarily with Hill's stopping. The object of this operation was, by leaving an unoccupied space in the pulp cavity to provide means for the safe passage of the pulp through the irritable stage which might ensue upon filling, and which its inclosure within bony walls was particularly likely to occasion. Such an operation was not likely to be successful where irritation or inflammation already existed.

Dr. H. F. Bishop stated that he had had the operation just described performed on the pulp of one of his own teeth, and he had strong hopes of a successful issue. The cavity was filled with tin foil; the use of a non-conducting substance he considered highly important.

Dr. W. W. Allport being called upon to explain his method of treating exposed dental pulps, stated that where the exposure was very slight he

enlarged the opening, and with a sharp gouge-like instrument cut out a piece of the pulp, leaving delicate flaps, which, falling together, unite and heal; he removes all friable edges of dentine about the opening of the pulp cavity, that if left might cause irritation. The lips of the wound being gently brought together should be touched with calendula, then cover the mouth of the pulp cavity with a few layers of bibulous paper, and fill with Hill's stopping. This filling might be removed from time to time for observation, and a gold plug introduced when all appearances of inflammation had disappeared. A great point to be observed was that there should be no pressure exerted on the pulp. He said that any other part of the body was capable of healing after an incised wound, and inferred that the pulp could be no exception. An amputated finger may be healed, but not by tying it up tightly, and dentists generally operate upon an exposed pulp in that way: the pressure causes irritation, the irritation inflammation, and that strangulation and death; but cut off a little of the pulp, and prevent pressure, and it will heal kindly. At the beginning of his experiments he was frequently unsuccessful, but had since attained most gratifying results, which he hoped would be an encourgement to perseverance in others.

Dr. H. F. Clark said, it had been his custom to fill temporarily with tin foil where there was a fresh exposure of the dental pulp, but since the introduction of arsenic he had discontinued that practice.

Dr. John Lovejoy used, in the old time, to cap a good many pulps, and found lead the best non-conductor.

Dr. B. Lord thought the best way to save a tooth and avoid an abscess when the pulp was exposed, was to remove the pulp and fill the roots.

Dr. B. F. Arrington was so strongly impressed with Dr. Allport's remarks that he expressed his willingness to embrace his theory unhesitatingly.

Adjourned to Wednesday at 10 A.M.

SECOND DAY.—*Morning Session.*

Dr. Franklin presented a flask for vulcanizing, made by Dr. H. G. Allen, of New York. He commended it highly for general use, and especially for partial cases. In this flask the teeth are held in position in one section, from which the male and female models are both detached.

Dr. Arrington presented specimens of gold for filling teeth, manufactured by Dr. Lamm, a chemist of New Orleans. He described it as being very dense and soft, much more adaptable to the walls of a tooth than that commonly in use. He claimed for it that it could be welded without regard to moisture, and that it could be worked three times as rapidly as adhesive foil.

Dr. G. H. Hurd, of St. Louis, presented impression cups and artificial

dentures for the lower jaw, to exemplify his practice of obtaining atmospheric pressure upon lower plates where the alveolar ridge is greatly absorbed, by carrying a flange outward to the lip and cheek, and inward under the tongue.

Dr. Atkinson expressed his estimation of it as being the best thing in its way ever presented to the profession.

Dr. Salmon exhibited a dental chair capable of being inclined backward, laterally or obliquely, at an angle of 40 to 70 degrees, the first two movements being independent of each other, and the last obtained by their combination. The foot-rest is well secured, the arms low, and the back narrow. The head-rest is shaped to retain the head in position, and is capable of six different movements, all secured by three screws.

Dr. Salmon also exhibited an automatic mallet, regulated by means of a screw cap, which he claimed produces a greater variety of blows than can be obtained in regulating by slots or notches. By inserting rubber in the end of the hammer a blow is obtained more like the hand mallet, and with little noise. A rack for points accompanies the instrument; these points are very easily changed by leverage instead of twisting.

Dr C. Palmer exhibited nerve instruments and porcelain teeth.

On motion of Dr. J. G. Ambler, a committee was appointed to consider all improvements in dental mechanisms presented to the Convention and report thereon.

The Chair appointed Drs. J. G. Ambler, Franklin, Fuller, Gildea, Morgan.

Dr. Arrington moved for a committee of five to test Dr. Lamm's preparation of gold. Carried.

The Chair appointed Drs. Arrington, Atkinson, Bishop, Branique, Steel, Merritt.

Dr. I. Woolworth read a paper on Abnormal Conditions of American Teeth, and stated that he was preparing a work on the subject, for which he invited suggestions and facts from the profession at large.

Dr. John Allen said, every dentist should be well informed of the principles of dental physiology. By feeding children with bread made from fine flour they are deprived of twenty per cent. of the mineral constituents of wheat. He urged the use of unbolted flour.

Dr. Rich thought more might be effected by inducing mothers to use food which would supply their children with the proper aliment during the period of the formation of the teeth.

Dr. John Allen. In order to keep up a perfect organism, the proper elements must be supplied; we must begin right and keep right. He insisted on the use of unbolted flour to the twentieth year. The servants who immigrate to our shores have good teeth on their arrival, but they deteriorate, because the ingredients necessary to sustain those organs are lost. Where nations partake of the natural products of their soil as

food they have good teeth. In examining skulls from the Catacombs, the processes were found perfect, and the teeth which had dropped out were sound and well formed.

Dr. Franklin looked upon the idea of improving the condition of the teeth through the medium of the food as impracticable. Our teeth were pretty good considering how badly we live; indulgence in rich viands was a fruitful cause of dental diseases.

Dr. Gildea had often remarked the teeth of Europeans as sound and well developed; this he attributed to their diet, consisting of brown bread, cheese, and potatoes.

Dr. Rich attributed the fine robust forms and strong teeth of the Irish race to their simple food and out-door work, and such was the case in other lands. In traveling among the Egyptians and Arabs he found the laboring classes had good teeth; in Nubia toothache was unknown; while among the tombs of the Egyptian princes many of the skulls were found to have lost their teeth during life, and some of the teeth were found filled with cone-shaped plugs of gold. The loss of teeth by the lower classes with us was chiefly attributable to a lack of cleanliness, and the work required at our hands was to impart a knowledge of the laws of health.

Dr. Woolworth often found the benefits of good operations lost by the carelessness of the patient, whose co-operation with the dentist was essential.

Dr. Branique said, it was generally supposed that the food necessary for preserving the teeth was farinaceous, but some nations required carnivorous food. In the Pampas of South America beef was almost exclusively eaten, except during three months of the year, in the peach season, and yet the loss of a tooth among the natives was a very rare occurrence.

Dr. John Allen. Wherever man lives, there Nature provides his proper food.

Dr. Allport had heard and read much on taking food into the system to improve the condition of the teeth. It did not follow that because we have not good teeth we have not taken enough lime into our systems. Children fed at the same table show very different developments, not from want of lime but of assimilative power. A change in the action of the system is demanded.

Dr. W. T. Shannon said, let teeth be ever so finely developed, neglect will occasion their decay, while if kept perfectly clean, the secretions of the mouth being healthy, they will be preserved. The brush and toothpick, especially the latter, were the great conservators.

Dr. C. E. Latimer thought caries was caused by nothing but acid, and this was generated in the mouth by retained food and vitiated mucus. He disbelieved in any such conditions as calcareous caries, or "dry rot," and alkaline caries. He commended phosphate of lime lozenges for neutralizing acids about the teeth, and supplying lime salts in solution.

Dr. Arrington was satisfied that the kind of food has nothing to do with the decay of teeth; among the colored population of the United States the loss of teeth between the ages of five and thirty-five was three times as great as among the whites. In the lower orders of society he believed decay of the teeth was much more prevalent than among the upper classes. He moved the appointment of a committee of three to investigate the conditions and causes of decay among the various races and classes in this country, to report at the next annual meeting; which was carried.

Adjourned to 7½ P.M.

SECOND DAY.—*Evening Session.*

The subject of Mechanical Dentistry was taken up for discussion.

Dr. John Allen said, upper dentures should be made four times stronger for articulating with lower natural teeth than for artificial ones. If both upper and under sets were required, the plate might be made very thin. If pressure is brought to bear outside the alveolar ridge, the plate must be stronger. These were little things, but they go to make up the sum of perfection. It was much more difficult to adapt lower teeth than upper ones; he had made wide plates and narrow, with flanges and without, but was unable to determine that any one form was adaptable to all cases. His favorite material for taking impressions is plaster, which he removes as soon as set. He finds the weight of continuous gum-work no hinderance to its use; if the plate fits well, the patient can tell no difference between ten and forty dwts.; the atmospheric pressure overcomes the weight. Hard palates should be accommodated by deepening the impression, so as to relieve the pressure, in conformity with the bone. He uses a die of fusible metal to follow that of zinc, which spreads the plate a little. For deep-roofed mouths the plate must be well struck up and not carried too far back. Wearing any plate makes the mouth softer.

Dr. G. H. Hurd believed that neuralgia was sometimes occasioned by an incorrect articulation. Greatly improved suction was sometimes obtained by carrying the plate on to the soft parts.

Dr. B. W. Franklin claimed that more judgment and skill were necessary in mechanical than in surgical dentistry. No part of the profession must be ignored by any one. He urged the young men to be thorough in their work. In supplying artificial dentures the first step was to know that the natural foundation was in a good healthy condition. For taking an impression he could conceive of no case where wax was better than plaster. A great deal depended upon a correct articulation; it was of the utmost importance that the anterior superior should strike the posterior inferior cusp. He wanted no articulator with lateral and upward and downward movements; he made his with plaster, so that when the sections were together they fitted firmly without any shifting. He obtained a correct articulation by causing the patient to swallow while closing the jaws.

Dr. W. B. Roberts always made his bearings equal, neither backward nor forward. When the air was exhausted from a suction plate which fitted the mouth properly it should not move.

Dr. Shannon found that by throwing the body backward and the mouth forward a correct articulation might always be obtained.

Dr. Atkinson said, the varieties of material for artificial teeth suited different operators, each one liking his own way best. Referring to Dr. Hurd's improvement, he said it was a blow to those men who talked the most and told the least of the details of their work; who kept things back so that they might still be ahead a little. The profession owed more to Dr. John Allen than to anybody else or all else for his success in restoring the natural expression of the face. We come together to give and to receive, to deal in ideas; we are all partly developed, no two being quite on the same level, each should be ready to impart of that to which he has attained.

Dr. John Allen animadverted severely upon the custom, far too prevalent, of duplicating a few styles of teeth in the mouths of hundreds of people with all classes of features. So long as block or gum teeth are used where joints have to be made, a stiff and unnatural appearance will be the result. He advocated the continuous gum as avoiding this.

Dr. H. F. Bishop extracts teeth in the morning, cutting away the edges of the alveolar processes, and inserts an artificial substitute before night. He found this course useful, practicable, and comfortable.

Dr. H. Townsend and R. P. Perry agreed with the last speaker, and stated illustrative cases.

On motion of Dr. W. H. Atkinson, a committee of five was appointed to report suitable resolutions on the death of Asahel Jones, Esq.

The Chair named Drs. A. McIlroy, J. Allen, W. H. Atkinson, B. W. Franklin, J. Branique.

The hour of final adjournment was fixed for Thursday at 10 P.M.

After much discussion, it was decided that the next meeting should be held in New York, on the first Tuesday of March, 1867.

Adjourned to Thursday at 10 A.M.

THIRD DAY.—*Morning Session.*

Dr. I. Woolworth presented specimens of rubber approximating in color to that of the natural gum.

Dr. T. L Buckingham made mention of several valuable experiments of Dr. Wildman in the preparation of rubber for dental purposes; in the English rubbers a light color is obtained by mixing as much as seventy-five per cent. of foreign substances with the caoutchouc gum. These materials were sometimes poisonous, as in the case of sulphate of baryta, which had been discovered in the residuum from the crucible. Any gum which contains much earthy matter will absorb the mucous secretions, and the consequent uncleanness might cause inflammation. He had no objection

to the patenting of any discovery or invention, but was opposed to keeping secret any part of a process protected by patent right.

Dr. J. G. Ambler, from the Special Committee on Dental Mechanisms, reported a vote of thanks to Dr. Hurd, of St. Louis, for his offer that the members of the Convention should use his impression cup and device for dental plates on trial for one year, free of charge. The report was adopted and the vote passed.

The Committee on the preparation of gold presented by Dr. Arrington were requested to report at the next session.

Dr. A. McIlroy, from the Special Committee, reported the following resolutions of respect and sympathy on the death of A. Jones, Esq., which were adopted.

Whereas, The American Dental Convention has learned, with profound sorrow, of the death of Mr. Asahel Jones;

And whereas, Mr. Jones has so long been thoroughly and inseparably identified with the dental profession, individually and collectively, as perhaps no other man ever was; therefore

Resolved, That this Convention desires, as far as mere words can, to express its sense of the irreparable loss the dental profession has sustained in the sudden removal of its late colaborer and untiring friend, Mr. Asahel Jones.

Resolved, That the Secretary transmit a copy of these proceedings to the family of our late lamented and universally beloved associate, and to the dental journals for publication.

The Causes of Dental Caries was now taken up for discussion.

Dr. Buckingham, in answer to a question as to the chemical causes of decay, said that chemical action, as the term chemical is now used, could only take place in dead substances, unless the agent was sufficiently strong to destroy the vitality and then decompose the substance. Where changes take place in bony structure, they are called either physiological or pathological. Destroy the vitality of soft animal tissue, and it will run into decomposition very rapidly, unless it is deprived of its moisture, and then it may be preserved an indefinite length of time; but there is so little soft tissue in a tooth that it does not decompose when extracted, nor if it is left in the mouth and its vitality destroyed, provided its dentine is in a healthy condition. This we see every day, for when we destroy the pulp and fill the cavity with gold, the dentine of the crown must be deprived of its vitality, and yet these teeth are very little more liable to decay than others that are sound. Decay is dependent on the vitality of the tooth. Healthy teeth resist the action of decomposing agents; some persons used acid food all their lives and yet their teeth remain perfect. The first change that takes place in the dentine is, that its vitality is either destroyed or weakened, and then corroding agents easily affect it. The enamel having lost its support is soon broken down, and then decomposing agents find lodgment in the cavity. He believed that diseases of the teeth were transmissible from parents to children, and still they might be controlled in most cases. Any course that would improve the general

health would have a beneficial effect on the teeth. The better class of society, who pay attention to cleanliness, and have good diet, generally have better teeth than the more negligent. Climatic influences might also have their effect in destroying the teeth.

Dr. W. H. Atkinson. Every body is in a depolarized condition, or state of sleep, until the equipoise of electrism, magnetism, and chemism, which constitutes its sleep, becomes disturbed by something capable of exciting either of these in greater degree than the others, which predominance would constitute polarization, or the wakeful state—activity. The form type of a tooth in one sense is a unit, in another a combination of smaller units, all of which involve in their individual presence the idea of the modes of motion just named, electrism, magnetism, chemism, which are but the servants of the form type in the construction of the tooth as a whole. It is evident, therefore, that one portion or tissue of a tooth may be perfectly healthy, while another portion, of enamel, dentine, or cement, may be so poorly organized as to be subject to very feeble disintegrative agencies. When the tooth has been constructed to the entire satisfaction of the form type and normally set in its proper socket, its power of resistance is marvelous, and incalculable by any known means; but any compromise short of this is easily demonstrable by mechanical and chemical tests of disintegration. Chemism destroys by *solution* the stratum of molecules next to the chemical agent, sweeping successively away layer after layer as long as there is greater affinity for any of the constituents of the organism in the solvent than among themselves, or in other words, until the power of the solvent is exhausted by the work performed. Instance the example of nitro-muriatic acid, sweeping indiscriminately away the whole of the substance of the tooth, animal and mineral. Integration and disintegration being in equipoise, sustains the body already formed in a state of equilibrium or health; excess of integration expressing hypertrophy of the body just to the extent of its presence, and excess of disintegration, atrophy, in like manner.

This question of physiology and pathology (the latter being a functional action, below the true physiological standard, accepted by the form type in preference to death) leads us into the etherial department, or border land between spirit and matter, both being properly defined by the word substance, of which they are differential degrees. All planetary substance, in order to attain individual development, must pass the ordeal of chaotic and heterogeneous states before reaching homogeneousness. Chaos may be solid or fluid, but if any portion be set apart to constitute an individuality, fluidity must be invoked. This holds good no less in the smallest constituent body, cell, or molecule, than in vessel, nerve, muscle, or tendon, each one of these having a sea of fluid in which to act freely in the performance of its function, which, be it small or great, must possess a plus quantity of hydrogen and oxygen, constituting

water, the great fluidifying agent. When there is water enough to constitute this sea in proper proportion, each molecule is enabled to whirl in a constant round of obedient activity for the use of the tissue it helps to constitute; but when dry, the sea having become so circumscribed as to press one molecule or cell against another, it is impossible for them to perform their assigned functions. That molecular and organic life are not destroyed by simple desiccation, we have proof in the muscle of the mummy, a strip of which simply soaked in water for a few hours will display, under the microscope, all its normal qualities of fibre and fibril.

Dr. John Allen. Physiology teaches that if the human system is deprived of its proper aliment it withers and dies. The soft and hard tissues are both sustained by the same principles; unless the supply of mineral food is kept up, so as to maintain the equilibrium, particle after particle of the teeth is decomposed and carried away.

Dr. Rich attributed caries of the teeth to the presence of acids, and this even in cases of great cleanliness, owing to a diseased condition of the mucous membrane of the mouth or stomach. Saliva, if alkaline, would not affect the teeth, therefore an alkaline instead of an acid condition should be obtained. The difficulty was to accomplish this.

Dr. J. Allen. The acid of the saliva should be corrected by an excess of mineral substances in the food.

Dr. Rich had seen alkalies plied in every form without success. This evil could not be corrected through the food. He had seen a man die for the want of lime in his bones, who had been fed on superphosphites of iron, lime, and soda.

Dr. Franklin said, the secretions of the mouth in health were always neutral, and with disease they became acrid. How to maintain this neutrality was what we wanted to know. That caries was a disease he considered to be an extreme announcement. Its immediate cause was the retention of mucus and food under the free edge of the gum as well as in other positions.

Dr. Atkinson said, the cause of acidity of the mucous secretions was not ascertained. This was the unknown god yet to be declared. A healthy condition was either neutral or alkaline. Compatibility between patient and operator was necessary to success in all dental operations, as the moral state had much to do with the physical condition.

On motion of Dr. Rich, the regular order was suspended to hear a report of the action of the American Dental Association on the claims of the Dental Vulcanite Company.

Dr. W. H. Morgan reported the agreement published in the October number of the Dental Cosmos, the terms of which, he said, were, in his view, as good as could be obtained. A circular would be issued, with the form of license, to all the dentists of the country. The commissioners had not in any way committed themselves to the validity of the Cumming's patent for the application of vulcanized rubber to dental purposes. A

decision had been obtained affirming its legality, but it was the opinion of eminent lawyers that on appeal, with the introduction of testimony which had been ruled out in the late trial, the decision of the U. S. Circuit Court would be reversed.

A general expression of opinion followed upon the whole subject of rubber patents, which came in for a large share of denunciation, the Cumming's claim finding no favor with any party. A very large number present expressed the determination to abandon the use of vulcanized rubber rather than submit to the demands of the company.

By general consent, Dr. J. B. Rich offered the following resolution:

Resolved, That this Convention send the usual number of delegates to the next meeting of the American Dental Association.

A very lengthy debate ensued, in which the position was taken on the one hand that this was not a local society, and that the Constitution of the American Dental Association would preclude the admission of such delegates to its deliberations; the contrary opinion was also maintained.

The resolution was adopted by a close vote.

Adjourned to 7½ P.M.

Closing Session.

The Convention was called to order at 7½ P.M. by the President, Dr. W. B. Hurd. The minutes were read and approved.

The Treatment of Dental Caries occupied the attention of the Convention.

Dr. Shannon spoke of amalgam fillings as affording the poorest protection from decay, and extremely difficult of removal when the tooth had become painful from any cause. He recommended for the latter purpose a rose-headed drill highly heated.

Dr. B. Lord, if it were a dead tooth, would drill through the amalgam to evacuate the secretions.

Dr. Atkinson said that in drilling into a tooth about which there was inflammation, the operation might be divested of much of its painfulness by traction in a direction from the socket.

Dr. J. S. Latimer believed prevention was the best treatment; the causes that induced decay he admitted were not easily reached. If acids were at work, they should be neutralized. Caustic alkalies would destroy the teeth; carbonate of potash was innocuous. His antacid treatment would consist of the free use of chalk and lime water.

Dr. Clark attributed a large share of decay to the secretions from the gum about the necks of teeth.

Dr. Castle ascribed a large proportion of dental caries to the gastric acids of the stomach. Chemical doctors and dentists presented very fine theories which proved very unsuccessful in practice. The human system could take up no more of any ingredient than it needs at the time without suffering for it.

Dr. Bogue said that by paying attention to the laws of nature we should preserve our teeth. It was necessary that they should be exercised, by chewing the food thoroughly, and by brushing both teeth and gums after eating. Dogs who live on the chase have fine teeth, while those that are pampered lose theirs from want of exercise, and also from the effects of acid exudations from their gums.

Dr. Castle, in opposition to the position that feeding with phosphates would correct acid secretions, said that a dog might be fed with bones until he voided nothing but lime, and yet his gastric juice would give an acid reaction.

Dr. C. R. Butler called for an expression of opinion on the treatment of sensitive dentine.

Dr. B. Lord treated sensitive dentine by removing it as quickly as possible with suitable sharp instruments. He preserved the deciduous teeth as long as possible. When the mouth is crowded with teeth, he thins them out, removing as many as eight if necessary.

Dr. Shannon found much relief experienced from the application of caustic potash to the sensitive surface; in shallow cavities he applies arsenious acid.

Dr. Palmer obtunded sensitive dentine by creosote. He deprecated the use of arsenious acid in teeth save for devitalizing the dental pulp.

Dr. H. R. White said, he had filed and polished down the enamel of imperfect teeth, and by the application of lime, carried through the system in the form of hypophosphites of lime and soda, he had experienced wonderful success, in a fresh growth of enamel over the abraded surface. With children of a strumous diathesis, or a consumptive tendency, the teeth were found white in spots by administering lime at intervals; keeping up the practice for two or three years, he obtained very marked improvement. A decayed tooth being disintegrated, he believed there was no possibility of restoring it by natural means.

Dr. Atkinson said, it was well enough to give advice; but how could it be taken on the strength of facts dissimilar to any that had ever before been heard of? He had not believed it possible that even a mere novice could suppose that enamel might be formed after the enamel membrane had exhausted itself. That the phosphates of lime and soda were capable of acting on the fluids of the mouth so as to restore the enamel, was more than problematical, to his mind it was absurd, and those who make such assertions should present their proofs. The assumption of such a theory either betokened an entire lack of study on the part of the propounder, or everybody else was very much in the dark. Nature would appropriate just so much of the phosphates, and no more than she needs; he had never been impressed with the wisdom of the contrary theory.

Dr. Rich said, the proper way of presenting anything so new and unheard of would be to bring the individual case before the Convention that it might be scrutinized. It was not surprising that it should be re-

ceived incredulously; he believed the gentleman entirely mistaken in his facts and assumptions. If enamel might be reproduced, the discovery would prove of incalculable benefit, but such a departure from all previous ideas and experience on the subject was only to be accepted on the most incontestable proof.

Dr. White supported his statement, and gave the name and address of a person whose teeth had been thus restored.

Dr. A. M. Asay had watched teeth in the mouth of children where, in his judgment and opinion, enamel, rough and pitted, had become perfectly developed.

Dr. Rich thought that was nothing more than a wearing away of the roughened surface with advancing years; he had seen such cases himself.

Dr. Castle said, he knew of a scientific dentist who got hold of such a case, and set about to fill all the little pits in the enamel.

Dr. Rich moved for a committee of five to revise the Constitution in the interim before the next meeting in March. Carried

The Chair announced Drs. Rich, Franklin, Horne, Clarke, and Castle as the Committee on Revision.

The Executive Committee to consist of Drs. Franklin, J. S. Latimer, C. Merritt, W. C. Parks, I. W. Lyon, to which the President and Secretary were added by vote.

On motion of Dr. Rich, the Executive Committee was instructed to give notice of the next meeting in the New York *Tribune*, *Times*, and *Herald*, once a week for one month previous to the time appointed for its session, and in all the dental journals in the country.

At 10 P.M. the President declared the American Dental Convention adjourned to the 1st Tuesday in March, 1867.

The following are the names of those who signed the Constitution and became members:

G. H. Perine,	New York.	W. A. Bronson,	New York.
A. McIlroy,	"	C. E. Latimer,	"
J. A. Bishop,	"	J. Branique,	"
W. H. Atkinson,	"	A. P. Preterre,	"
W. C. Horne,	"	R. M. Streeter,	"
J. G. Ambler,	"	T. Burgh,	"
B. W. Franklin,	"	H. Crane,	"
H. F. Clark,	"	A. Y. Paddock,	"
C. A. Alden,	"	W. Potter,	"
A. L. Northrop,	"	G. W. Lovejoy,	"
J. B. Rich,	"	H. R. White,	"
R. P. Perry,	"	W. W. Branique,	"
G. Chevalier,	"	C. F. Skeele,	"
J. Lovejoy,	"	T. L. Buckingham,	Philadelphia.
J. Allen,	"	S. S. White,	"
C. D. Allen,	"	H. Townsend,	"
W. B. Roberts,	"	I. R. Reubencame,	"
J. S. Latimer,	"	G. Roberts,	"

F. S. Wells, Philadelphia.
J. J. Griffith, "
A. M. Asay, "
W. C. Parks, Brooklyn.
W. B. Hurd, "
H. G. Mirick, "
C. D. Cook, "
W. F. Shannon, "
A. H. Brockway, "
J. H. Smith, New Haven.
S. Mallett, "
I. Woolworth, "
E. S. Gaylord, "
I. A. Salmon, Boston.
H. J. McKellops, St. Louis.
I. Forbes, "
G. H. Hurd, "
J. S. Knapp, New Orleans.
B. M. Gildea, "
L. Buffett, Cleveland, O.
S. R. Thompson, Poultney, Vt.
G. B. Steele, Richmond, Va.
P. Sloan, Canajoharie, N. Y.
J. C. Austin, Albany, N. Y.
B. B. Alfred, Georgia.
W. C. Downs, Cuba, W. I.
F. N. Johnson, Philadelphia, N. Y.
H. F. Bishop, Worcester, Mass.
B. F. Arrington, Wilmington, N. C.
S. E. Arms, Elizabeth, N. J.
C. Merritt, Bridgeport, Conn.
H. F. Smithe, Pine Plains, N. Y.
E. D. Fuller, Peekskill, N. Y.
H. L. Sage, Bridgeport, Conn.
C. Palmer, Warren, Ohio.
T. F. Pruden, Hoboken, N. J.
F. S. Wells, Plainfield, N. J.
I. N. Scranton (no residence).
L. Munster (no residence).

NORTH CAROLINA DENTAL ASSOCIATION.

The dentists of this State met at Greensborough, on the fifth of September, and organized the North Carolina Dental Association, which is to meet semi-annually. The following are the officers elected:

President.—Dr. B. F. Arrington, Wilmington.

1*st Vice-President.*—Dr. R. P. Bessent, Salisbury.

2*d Vice-President.*—Dr. J. W. Hunter, Salem.

Recording Secretary.—Dr. R. D. Fleming, Warrenton.

Corresponding Secretary.—Dr. V. E. Turner, Henderson.

Treasurer.—Dr. M. R. Banner, Mt. Airy.

The first semi-annual meeting will be in Raleigh, and will commence on the first Wednesday in December next.

CORRESPONDENCE.

Havana, Cuba, June 15th, 1866.

Editor of the Dental Cosmos:

Those of our professional brethren in the metropolitan cities of the North who are favored with more or less of Spanish American patronage, may no doubt be interested by some observations made here of that peculiar diseased condition of the mucous membrane so prevalent in the mouths of these people that it might, with some degree of justice, be denominated in common parlance *tropical sore mouth.*

There are few here, who have passed the age of thirty, whose mouths do not bear traces of its ravages, and in many it has been very destruc-

tive; this evidently because our profession, being less developed here, has not disseminated a knowledge of buccal hygiene to the extent which it has done in the North.

The people here seem careless of the presence of irritation in the mouth, until the teeth are loosening and giving them pain.

So far as my observation of two or three months enables me to determine, it is the chief cause of the loss of the teeth in this country, and in this point or view its pathology and therapeutics become highly interesting, while it is only here in its home that data are to be found sufficient to satisfy our inquiries in these directions.

The predisposing cause is without doubt the effect of climate, producing marked debility of the physical powers, and extreme nervous sensibility, as compared with the tonic effects of our northern clime.

Those of us at the North who are accustomed to more or less of Spanish Americans, well know how much more delicacy of manipulation is required in the mouths of our tropical clients than in those of our Northern patrons. In regard to climatic effects, I may, for the purpose of illustrating its direction, mention that some weeks since I injured my own foot, to the extent of a mere scratch, in the sea-bath; and, not accustomed in the North to take any notice of so slight an injury, I was surprised at the end of three weeks thereafter to find myself confined to the house, by an extended and somewhat erysipelatous inflammation, which only yielded to rigid quietude and careful medications—this, too, at a time when I was in apparently perfect physical condition.

In this case the predisposing cause was clearly climatic, while the immediate cause was the rock which gave the scratch; and this is precisely the case with the diseased condition in question. Its immediate cause is unquestionably the limestone taken into the system in great abundance.

The whole Island of Cuba is, I am told, one mass of limestone; and certainly in this vicinity I have as yet met with no other outcrop in the geological formation. Consequently the water holds large quantities of the carbonates in solution, which, being imbibed at every draught, are precipitated from the saliva as tartar incrustations upon the necks of the teeth, under the edges of the gums, giving to them the scratch which the foot received in the sea-bath; with the difference that in the mouth the limestone is allowed to deposit and remain as a *constant* cause of irritation and inflammation, which often extends over the entire mucous membrane of the mouth, presenting to us, in its various developments, the diseased conditions which have so often puzzled us in forming our diagnosis, or rather made us sometimes uncertain in our confidence.

As in other communities located in limestone districts, the teeth here are comparatively well formed, and of firm texture, resisting well the decaying influences even of the highly vitiated and corrosive condition of the saliva which inflammatory action in the mouth always imparts to it.

But these irritating deposits induce rapid absorbtion of the alveolar borders, the teeth thereby becoming loosened, and finally fall out, or become so troublesome as to compel their removal.

The proper treatment in these cases is obvious—viz., promptly, carefully, and patiently to remove every particle of the deposit from around the teeth, together with the use of alkaline washes, alternated in severe cases with vegetable astringents, and, when indicated, topical depletion, directing the frequent use of a soft brush to prevent its reaccumulation. The old barbarism of the hard brush, in all cases in my opinion is injurious both to the teeth and to the gums, would be doubly so in this latitude.

While many of the severer forms of the tropical sore mouth are quite possibly specific in its character, yet I have been surprised to see how rapidly many cases have yielded to the treatment above indicated.

Of the effects upon the stomach of the vitiated condition of the saliva induced by these irritations in the mouth, I have not as yet had sufficient time to gather reliable information. But if a prediction would be allowed me, I would say that dyspepsia is a frequent disorder in this island as compared with the North.

Thus, while the climate, by its debilitating effect, acts as an exciting cause of irritability, these irritations in the mouth react through the medium of the stomach, with powerful debilitating effect upon the general health, which, together with lack of bodily exercise (which old Sol does not permit of), explains in some measure the absence here of that robust physical development and activity which characterizes residents of more northern latitudes. Yours,

E. Wilson, M.D.

OBITUARY.

Victims of the Cholera in St. Louis.—The terrible scourge which has prevailed with such fearful mortality in St. Louis during the past few months, found a number of victims in the dental profession.

The first of these was Otto Steick, son of Dr. F. T. Steick.

The second was Robt. Grace, a young man who, during twelve years' service in the laboratory of Dr. Henry Barron, had gained for himself the esteem of his preceptor and all professional acquaintances.

The last victim was Wm. Lumsden, aged 34. Born in Kelso, Scotland, he recently moved to St. Louis from Paris, France, where he had spent ten years as a mechanical dentist. At the time of his death, he was engaged in that capacity by Dr. Isaiah Forbes. He leaves a young widow and child who, although left among strangers, are not without friends in their sudden bereavement. The sympathies of the profession of the city are with all the afflicted families. A. M. L.

PERISCOPE OF MEDICAL AND GENERAL SCIENCE IN THEIR RELATIONS TO DENTISTRY.

BY GEO. J. ZIEGLER, M.D.

Anthropology.—In an address to the British Association, MR. WALLACE remarked (*Dublin Med. Press*): "Anthropology is the science which contemplates man under all his varied aspects—as an animal, and as a moral and intellectual being—in his relations to lower organisms, to his fellow-men, and to the universe. The anthropologist seeks to collect together and systematize the facts and the laws which have been brought to light by all those branches of study which, directly or indirectly, have man for their object. These are very various. The physiologist, for example, studies man as a wondrous and most complicated machine, whose parts and motions, actions and reactions, he seeks thoroughly to understand. The comparative anatomist and the zoologist compare his structure with that of other animals, take note of their likenesses and differences, determine their degrees of affinity, and seek after the common plan of their organization and the law of their development. The psychologist studies the mind of man, its mode of action, and its development; compares it with the instincts and the reasoning faculties of the lower animals, and ever aims at the solution of the greatest of problems—whence and what is mind? The historian collects and arranges the facts of man's progress in recent times; the geographer determines the localities of the various races that now inhabit the earth, their manners, customs, and physical characteristics; the archæologist seeks, by studying the remains of man and his works, to supplement written history, and to carry back our knowledge of man's physical, mental, and moral condition into *pre-historic times*; the geologist extends this kind of knowledge to a still earlier epoch, by proving that man coexisted with numerous animals now extinct, and inhabited Europe at so remote a period that the very contour of its surface, form of its hills and valleys, no less than its climate, vegetation, and geology, were materially different from what they now are, or ever have been during the epoch of authentic history; the philologist devotes himself to the study of human speech, and through it seeks to trace out the chief migrations of nations, and the common origin of many of the races of mankind; and, lastly, the phrenologist and the craniologist have created special sciences out of the study of the human brain and skull. Considering the brain as the organ of the mind, the phrenologist seeks to discover in what way they correspond to each other, and to connect mental peculiarities with the form and dimensions of the brain as indicated by the corresponding form of its bony covering. The craniologist, confining his attention to the skull as an indication of race, endeavors to trace out the affinities of modern and ancient races of men, by the forms and dimensions of their crania. These various studies have hitherto been pursued separately. There has been great division of labor, but no combination of results. Now, it is our object as anthropologists to accept the well-ascertained conclusions which have been arrived at by the students of all these various sciences, to search after every new fact which may throw additional light upon any of them, and, as far as we are able, to combine and generalize the

whole of the information thus obtained. We cannot, therefore, afford to neglect any facts relating to man, however trivial, unmeaning, or distasteful some of them may appear to us. Each custom, superstition, or belief of savage or of civilized man may guide us toward an explanation of their origin in common tendencies of the human mind. Each peculiarity of form, color, or constitution may give us a clew to the affinities of an obscure race. The anthropologist must ever bear in mind that, as the object of his study is *man*, nothing pertaining to or characteristic of man can be unworthy of his attention. It will be only after we have brought together and arranged all the facts and principles which have been established by the various special studies to which I have alluded, that we shall be in a condition to determine the particular lines of investigation most needed to complete our knowledge of man; and may hope ultimately to arrive at some definite conclusions on the great problems which must interest us all—the questions of the origin, the nature, and the destiny of the human race. I would beg you to recollect also that *here* we must treat all these problems as purely questions of science, to be decided solely by facts and by legitimate deductions from facts. We can accept no conclusions as authoritative that have not been thus established. Our sole object is to find out for ourselves what is our true nature—to feel our way cautiously, step by step, into the dark and mysterious past of human history—to study man under every phase and aspect of his present condition, and from the knowledge thus gained to derive (as we cannot fail to do) some assistance in our attempts to govern and improve uncivilized tribes, some guidance in our own national and individual progress."

"*Dental Specialty.*—We sometimes reproach ourselves for not sufficiently appreciating the dental specialty. We are known to have no great affection for specialties as such, and to look with disfavor upon the tendency to multiply which they have shown of late years. But there are conspicuously two specialties, the reasonableness of which we all recognize both in theory and in action. The one is the ophthalmic, the other the dental specialty. Part of the explanation of the fact that the profession has not felt more warmly and fraternally to practitioners of the dental specialty may be found in this, that some of the lowest parts of the art of dentistry have been practiced by uneducated and unprofessional men, whose only idea in connection with a bad tooth was to extract it out of the patient's mouth, and a shilling out of the patient's pocket. This was really the sum of the dental art at a time not very remote. It is not surprising, therefore, that it did not to any extent excite the interest or command the respect of the profession.

"Dentistry now, however, is a very different thing. The art itself has become conservative, and the men who practice it include fellows of the Royal Society, fellows of the College of Surgeons, and a certain number of well-educated surgeons. Most of us know that dentistry has passed into higher hands from our personal experience of the skill and culture of those who practice it. We do not mean to flatter our brethren of the dental department, nor to imply that we think it a high pleasure to submit to their peculiar operations; but, having respect to the sensitiveness of the organs upon which they operate, and the variety of manipulations required, we must admit that their operations are among the nicest and most difficult of minor surgery, and frequently call for the higher quali-

ties of the surgeon. The mingled strength and delicacy with which a dentist manipulates on the very borders of the pulp cavity we must allow to be a very fine illustration of skilled handiness, to say nothing of the detailed demands upon the faculty of judgment made by the various diseased states of teeth.

"But if aɩy of our readers are blessed with such good teeth as not to be able to indorse these opinions from their own experience, and yet would like to study the present condition of dentistry as a most useful art with a scientific basis, we should refer them to the 'Transactions of the Odontological Society for 1863–65,' a volume containing various scientific papers, very well illustrated, and affording ample proof that the most common diseased states of the teeth are being studied in the light of advanced physiology, as well as with a practical eye to the relief of suffering.

"It is perhaps only reasonable to expect much from a scientific dentistry. The objects of its study are within easy reach. They can be seen, and all the surrounding conditions can be minutely studied. They are so precious in point of usefulness and appearance that a wealthy community will not spare money to reward the art which saves them. Then their diseases are among the commonest things in life. Next to a cold in the head, perhaps the commonest evil that 'flesh is heir to' is caries of the teeth. And yet this common disease, which we see every day, is one of the unsolved problems of dental science. It is an actual fact, that dentists, as yet, give us only a very various and discrepant account of the causes of the decay of teeth. We know that there are national conditions favorable to the preservation of the teeth, and we fear we must add that our own national conditions are not very favorable to this end. The North American Indians have good teeth. So have the Negroes. A surgeon in one of the ships on the Franklin expedition to the Arctic regions informed Mr. Bate that he never saw a decayed tooth among the Esquimaux, although he made his observations on both living and dead subjects. Dr. Panum some years ago reported to the Danish Government on the health of the inhabitants of the Faroe Islands. One remarkable feature of it was the absence of tubercular disease of the lungs; but among other observations of Dr. Panum, we remember this, that it was common to meet persons of the age of seventy who had not lost a tooth. So that we have great national contributions to the solution of this pathological problem—the prevention of dental caries. Yet we cannot say that any accuracy of conclusion on the subject has as yet been realized. Whether the first steps in the process are strictly chemical, or rather vital; whether it is a process primarily of mere absorption, or of solution; and if of solution, then whether the solvent is one generated within the tooth or external to it,—these are questions to which Odontology gives only an uncertain answer. In this uncertainty we have another illustration of the fact that our knowledge of the commonest vital processes, and of departures from them, is in its very infancy. This is to be said, however, for good odontology, that it is eagerly prying into this mystery, and that some of our leading operative dentists are foremost in the knowledge of the minute structure of healthy teeth and of the agents by which this structure is impaired. The very volume to which we have referred contains an able paper on the Pathology of Dental Caries, by C. Spence Bate, Esq., F.R.S. Mr. Bate's theory of decay is, that it is in the first instance a vital process having its origin in a low vital condition of the

animal tissues of the teeth, especially of the cementum; that there is but a short step between this low vitality of the animal tissue and its decomposition; that when this decomposition happens, carbonic acid is generated in immediate contact with the salts of the tooth, which it dissolves. 'The removal of each atom of phosphate of lime in its turn exposes more of the animal tissue of the enamel to decomposition, and an increased chemical action is superinduced.' Mr. Bate's theory of decay is opposed to the more common one, which attributes the action on the teeth to an external acid, such as lactic, existing in the secretions of the mouth. He develops with much ingenuity, though occasionally with a want of clearness, the arguments in favor of carbonic acid generated *within* the tooth being the active agent of solution. The abnormal constitutional states favorable to decay of the teeth are those in which there is a defective removal of carbonic acid from the system. These are, according to MM. Harrier and St. Leger, phthisis, variola, measles, erysipelas, roseola, scarlatina, erythema, dysentery, chronic diarrhœa, and typhoid fever, as well as the state which exists during the suppurative process.

"Our respect for the dental department of medicine will be increased when it shall once determine the causes of caries, so as either to remove or to arrest them. Already they are partly controlled by mechanical processes which apparently retard decay. This power over the process of decay is so much believed in now that extraction of teeth in the best practice bears only a small proportion to the operation of stopping or filling. By the way, if this be the case, it makes rather in favor of the theory that would attribute caries to the operation of agents external to the tooth itself. There is undoubtedly, however, deep truth in the view that regards the vital condition of the animal tissues of the teeth. It is not a little curious that organs so largely earthy and inorganic in their composition should be among the first to show signs of degeneration. We should take caries for a sign. It may be that if we can control it, and materially promote the longevity of the teeth, we shall in that effort learn to promote the longevity of the whole system. The onus of doing this great service is to that extent on the laborers in the odontological department of the profession, whom we cordially recognize as worthy laborers in the domain of our art."—(*Lancet.*)

"*Professional Education of Candidates for the Examination in Dental Surgery in the Royal College of Surgeons of England.*—Candidates are required to produce the following certificates: Of being twenty-one years of age. Of having been engaged during four years in the acquirement of professional knowledge. Of having attended, at a school or schools recognized by this college, not less than one of each of the following courses of lectures, delivered by lecturers recognized by this college—namely, anatomy, physiology, surgery, medicine, chemistry, and materia medica. Of having attended a second winter course of lectures on anatomy, or a course of not less than twenty lectures on the anatomy of the head and neck, delivered by lecturers recognized by this college. Of having performed dissections at a recognized school during not less than nine months. Of having completed a course of chemical manipulation, under the superintendence of a teacher or lecturer recognized by this college. Of having attended, at a recognized hospital or hospitals in the United Kingdom, the practice of surgery and clinical lectures on surgery during two winter sessions. Of having attended, at

a recognized school, two courses of lectures upon each of the following subjects: viz., dental anatomy and physiology (human and comparative), dental surgery, dental mechanics, and one course of lectures on metallurgy, by lecturers recognized by this college. Of having been engaged, during a period of not less than three years, in acquiring a practical familiarity with the details of mechanical dentistry, under the instruction of a competent practitioner. Of having attended at a recognized dental hospital, or in the dental department of a recognized general hospital, the practice of dental surgery during two winter and two summer sessions.

"N. B.—The students of the London schools are required to register the above certificates at this college; and special returns will be required from the provincial schools. The fee for the certificate of fitness to practice as a dentist is ten guineas, over and above any stamp duty."—(*Ibid.*)

"*On the Nature of Muscular Irritability and the Relations between Muscle, Nerve, and Blood.* By RICHARD NORRIS, M.D., Birmingham. —Dr. Norris' report to the British Association for the Advancement of Science was an admirable contribution to physiology, and the several propositions were each inductively sustained. The subject was discussed under the following propositions:

"1st. That the property of irritability in muscle is capable of a high degree of exaltation above the normal standard, and that the highest degree of susceptibility is attained in cold bloods long after death, or under conditions tantamount to death.

"2d. That the forces of nerve and muscle, the neurility of the former and the irritability of the latter, are not only independent of each other for their existence and maintenance, but actually possess an antagonistic relation—that is to say, nerve tissue, instead of producing, is, when in action, constantly concerned in maintaining a condition of things which diminishes muscular irritability, and that not simply when it is engaged in the production of motion.

"3d. Conversely, that muscular tissue, relieved from the operation or influence of nerve tissue, gradually acquires exalted contractile powers either in the presence or absence of the blood.

"4th. That the blood, or the *nutritional plasma* derived therefrom, not only furnishes the materials by which muscular irritability is maintained, but is likewise the determining cause of that polar arrangement of the muscular molecules which maintains or restores the elongated or relaxed state.

"These propositions were sustained by constant reference to experiment, much consideration being devoted to the proof that the principle of volition, when in operation, exhausted the muscular and nervous forces, and produced the condition which in common parlance is recognized as fatigue; and that in the absence of volition—or, what amounted to the same, nerve in action—the forces of the system were considerably increased; hence the use of sleep was obvious. The nervous system was not only concerned in exhausting the muscular during the production of motion, but constantly while maintaining the normal position of the animal.

"Dr. Norris said that profound ætherisation, sleep, fainting, and death were different degrees of what might be called functional neural

paralysis in contradistinction to purely muscular, a form in which the special life of muscle was diminished or destroyed.

"The best condition for the exaltation of the peculiar life of muscle was the absence of nerve, as then the forces were not expended as fast as the chemical reactions between the muscular tissue and the blood led to their generation.

"In support of the final proposition, many experiments were adduced which clearly showed that the relaxed or elongated condition of the muscles was maintained by the blood, and that the blood under all circumstances opposed the state of contraction which it was the special function of nerve to bring about.

"The various affections of muscular fibre, as they had been observed in the author's experiments, were then described. 1. A muscle may exist in the elongated or uncontracted state with all its dynamical powers perfect; this is its normal condition in the absence of volitional effort. 2. It may exist in this state when deprived of all dynamics, or, in other words, in the absence of irritability. Both these conditions of relaxation may be associated with softness or flaccidity of the muscular structure—the former necessarily so, the latter not, as the fixity or rigor may prevail. Again, a muscle may exist in a state of complete contraction both in the presence and absence of its dynamics; in a state of softness or in a hard coagulated state. As with the state of elongation, so with that of contraction, the truly dynamical state is one of softness. Properly speaking, irritability is no more the tendency which a muscle exhibits to contract than the disposition it exhibits to elongate subsequently to contraction; in fact, a comprehensive definition must include both these conditions; neither are either of these states to be considered, as far as muscle alone is concerned, as conditions of rest, for they are both active states as long as the muscle is a vital structure, and both inactive when the dynamics of muscle are absent. The attractive state of the muscular molecules which represents contraction is the condition in which force is exhausted by the apposition of unlike polarities, while, the state of elongation being that in which every molecule is opposed to every other, force may be accumulated. In proportion to the amount of force accumulated in the molecules will be the intensity of their contractive or elongative energy, and also in the ratio of their charge will be their proclivity to disturbance, or, in other words, susceptibility to stimuli.

"The author combated the view of Dr. Radcliff, who regarded the contraction of a muscle as taking place simply on the withdrawal of some elongated force, and showed, by an analysis of the various conditions under which muscle existed that no theory met the case so well as that of Du Bois Reymond, in which the molecules of muscle were regarded as centres of electro-motor action, arranged in a dipolar series.

"In a word, one fluid, two forces or poles—the repulsive polar attitude maintained by the blood, and the attractive inducible by nerve and external stimuli."—(*Med. Times and Gaz.*)

"*On Certain Painful Affections of the Fifth Nerve.*—Lettsomian Lecture, delivered before the Medical Society of London, Session 1865–66. By Francis E. Anstie, M.D., London, Fell. Royal Coll. of Physicians, Senior Assistant Physician to the Westminster Hospital.

"Lecture II.—(*Concluded.*)—Having considered the *uncomplicated*

varieties of painful affections of the fifth nerve which come within the scope of our present inquiry, we have now to discuss those *secondary complications* which may take place in any one of these affections, and which have only of late years attracted the attention they deserve.

"II. If we turn to the excellent treatises of Valleix and Romberg, which appeared about twenty-five years since, we find a very inadequate importance assigned to these secondary affections. The convulsive spasms of the facial muscles which occur in the severer forms of tic could, of course, not fail to excite attention from the earliest times. Of the functions of special sense, Valleix only recognizes hearing as liable to be affected. Injection of the conjunctiva he speaks of as if it were a rare phenomenon. He does not mention modifications of nutrition at all, excepting those of the hair; and of modifications of secretion he only enumerates lachrymation, mucous flux from the nostril, and salivation, as occasional phenomena. Of disturbances of the stomach he was inclined to take a more appreciative view; and he mentions as a remarkable thing that he had never seen gastric disturbance cause facial neuralgia, but had very frequently observed its occurrence in the course, and apparently as a secondary result, of that affection. Still he gives no explanation of the matter.

"It is to M. Notta that we owe the first scientifically arranged treatise on the subject of those complications which affect the organs of sense to which the branches of the fifth nerve are distributed. In a series of papers published in 1854, this author gives an elaborate analysis of no less than 128 cases of facial neuralgia, from which we gather the following important facts: In the first place, as regards the organs of special sense. The retina was completely or almost completely paralyzed in 10 cases, and in 9 others vision was interfered with, partly, probably, from impaired function of the retina, but partly also from dilatation of the pupil, or other functional derangement independent of the optic nerve. The sense of hearing was said to be impaired in 4 cases. The sense of taste was perverted in one case, and abolished in another. Next, as regards modifications of secretion. Lachrymation was observed in 61 cases, or nearly half the total number. The secretion of the nasal mucous membrane was repressed in one case, in 10 others it was increased, upon the affected side. Salivation was observed in 14 cases. Unilateral sweating is spoken of more doubtfully, but is said to be probably present in some cases. Elevation of temperature is said to be present on the affected side of the head, in an undetermined but probably a considerable number of cases. In 8 cases there was decided unilateral redness of the face, and five times this was attended with noticeable *tumefaction*. In one case the redness and the tumefaction occurred, not only in the accesses of neuralgic pain, but also persisted in the intervals, and, in fact, were accompanied by a definite hypertrophy of all the tissues. In the conjunctiva vascular dilatation was far more frequent, occurring in as many as 34 cases. As regards *lesions of nutrition*, hypertrophy of the tissues of the affected side of the face was noted in four cases, in 2 the hair was noticed to be hypertrophied at the end, and several others are referred to in which the hair turned gray, or fell off The tongue also is reported to have been greatly tumefied in one case. As regards *muscular affections:* there were noticed convulsive contractions of the muscles of the affected side in no less than 52 cases. Of these 13 are noted as instances of contractions of the muscles of the lip and nostril, 10 as tre-

mor of the eyelid; in a great number of cases many muscles were simultaneously affected. *Permanent tonic spasm* was observed in the eyelids in 4 cases (when it was not due to photophobia), in 4 cases in the muscles of mastication, and in one instance in the muscle of the external ear. *Paralysis of the motor oculi*, inducing prolapse of the upper eyelid, was noted in 6 cases, and in the half of these cases there was also external strabismus. In 2 cases the facial muscles were paralyzed, obviously not from an original affection of the portio dura, but from severe neuralgia of the auriculo-temporal branch of the fifth. As regards the pupil, it was dilated in 3 cases, and contracted in 2 others, without any simultaneous affection of sight; in 3 other instances it was dilated, coincidently with considerable diminution of visual power. Finally, with regard to common sensibility, M. Notta reports 3 cases in which anæsthesia was observed. With regard to the hyperæsthesia so often noticed, he justly observes that it only occurs in the more advanced stages of the disease.

"I have analyzed the results obtained by M. Notta somewhat at length, because, with regard to the majority of the complications of facial neuralgia observed by him, my experience affords ground for the belief that his estimate of their proportional frequency is very correct, and I therefore preferred to give you his figures because they are drawn from a larger number of cases than my own. But there are certain especial complications, which are either not noticed, or are noticed so cursorily by M. Notta, as well as by Valleix, Romberg, and all the other writers whom I have studied, that I cannot refrain from citing my own experience.

"The first group of cases which have thus particularly attracted my attention are distinguished by the presence of remarkable affections of the vaso-motor fibres.

"The most important of these is facial erysipelas. Some years ago I was much surprised at observing, in a woman thirty-two years of age, an out-patient of the Chelsea Dispensary, a most acute attack of unilateral erysipelas of the face and head, supervening after she had suffered for two or three weeks from very severe and frequently recurring attacks of neuralgia, which affected all three branches of the fifth, but was most violent in the branches of the ophthalmic division. On the occurrence of the erysipelas the acute pain subsided, but the most intense tenderness remained for some days, and pressure anywhere in the track of a considerable branch of the nerve would re-excite a momentary spasm of neuralgic pain. Since that time I have been constantly on the look-out for similar cases, and I have made some observations for which I was not at all prepared. In some cases I have actually seen neuralgia of the fifth terminate in well-marked erysipelas of a strictly unilateral character: in four of these cases it was limited to the side of the nose, the infraorbital and frontal regions; in all of these the neuralgic pain had been limited to the supraorbital and superior maxillary divisions of the nerve. The last of these patients was a young man who came under my care at the Westminster Hospital a few weeks since, suffering from commencing erysipelas of the left side of the nose, forehead, and cheek. The circumstance which principally attracted my attention was a convulsive action of the left eyelid, such as is often observed in neuralgic affections. On questioning the patient, a very clear history of a previous severe neuralgic attack was elicited, and the existence of extreme tenderness to pressure in two limited spots, corresponding to the supraorbital notch

and the infraorbital foramen, was ascertained; there was also intense photophobia, lachrymation, and conjunctival congestion.

"But the facts concerning the connection of facial neuralgia with facial erysipelas are by no means limited to the cases in which the one absolutely terminates in the other. In no less than 22 patients who have come under my care suffering either from well-marked facial neuralgia, or else from severe migraine or from 'hysterical' headache, I have discovered the existence of a very strongly marked tendency to facial erysipelas, an attack of which would be brought about by the most trivial causes, such as very slight exposure to cold wind, or, on the other hand, such seemingly different influences as fatigue of body, or unusual mental anxiety or depression. I have now under occasional observation five individuals, in good circumstances of life, in all of whom there is a strong tendency, which is clearly inherited, to facial neuralgia, and an equally remarkable tendency to facial erysipelas, though it happens that in no instance of which I am aware has either of these persons suffered from erysipelas *directly* following a neuralgic attack. In another patient, also in good circumstances, and who recently died at a very advanced age, a strong inherited neuralgic tendency first manifested itself by a distinct outbreak of severe pain, which passed into the worst kind of confirmed tic, shortly after the termination of an acute attack of erysipelas.

"Another class of complications which I have particularly observed in facial neuralgia is a series of changes in the nutrition of parts supplied by branches of the fifth nerve. In a former lecture I referred to my own case, and I may now recount it as an illustration of several of these changes. In the first place, a year or two after the commencement of my attacks of frontal neuralgia, and at a time when the pains had been very severe, there occurred a painful thickening and tumefaction of the periosteum of the eyebrow, and also the formation of one or two dense white patches on the cornea, in the centre of which small phlyctenular ulcers formed. About the same time, probably, there occurred a great thickening of the fibrous tissue surrounding the upper end of the nasal duct, which formed a very thick and solid stricture. Some years later, when the neuralgic attacks had become on the whole much less frequent, they recurred with great severity during the state of prostration in which I was left by an attack of choleraic diarrhœa. At this time I first noticed that the hair of the eyebrow was whitened opposite the supraorbital notch, and that gray hairs were thickly strewn over the right side of the head for some time after the attack; and this phenomenon has occurred after every severe attack since that time. It only lasts in intensity for a few days, and the color soon becomes restored nearly to its natural tint without any falling off of the hair. Unilateral herpetic eruptions (a not very uncommon sequel of one form of neuralgia) have not occurred in my own case. Another nutritive phenomenon which has occurred to me during a spontaneous attack of pain, but which was also produced artificially on one occasion by experimentation with narcotics, is an excessive unilateral development of epithelium on the tongue.

"All these several changes I have repeatedly observed in neuralgic patients. I have even seen one of them—namely, the occurrence of fibrous stricture of the nasal duct, which might appear an accidental coincidence in my own case—reproduced under exactly similar circumstances in a female patient; and I suspect that closer inquiry into the history of many cases of epiphora depending on this sort of obstruction

would reveal the previous existence of neuralgia of the ophthalmic division of the fifth nerve.

"But there are also other and more distinct affections of bodily organs which may distinctly be traced to the secondary effects of a morbid condition of the fifth nerve extending itself to nerves which are centrally connected with the trigeminal. The occurrence of vomiting, in attacks of migraine which have a certain intensity and duration, is a typical example of this kind of reflex phenomenon.

"Time, however, will not allow me to dwell on the wide field of observation and inquiry which is presented by these more remote affections; and I must now pass on to the consideration of Diagnosis. It is chiefly with reference to their important bearing on this part of our subject that I have dwelt so particularly on the secondary nutritive changes which are apt to supervene in cases of neuralgia of the fifth nerve.

"The first question which occurs for consideration is—how to decide that a painful affection originates in the fifth nerve at all?

"Ever since the time of Valleix, most authors have disposed of this question summarily by inquiring as to the existence or non-existence of certain *tender points* at particular situations in the course of various branches of the fifth nerve. Supposing it were possible that a patient should be affected with universal and equally violent neuralgia of all the principal branches of the nerve, the situations in which the most important of these painful points would be developed are such as you see marked on this diagram: 1. The parietal point. 2. The supraorbital. 3. The trochlear. 4. The palpebral. 5. The ocular. 6. The nasal. 7. The infraorbital. 8. The malar. 9. The superior labial. 10. The mental. 11. The auriculo-temporal. [The lecturer gave many details as to the size and form of each of these tender patches.] Pressure on any of these points, even in the intervals of the neuralgic attacks, causes an exquisitely acute pain to dart along to the terminal branches which lie external (peripheral) to the tender spot.

"Valleix insisted that no painful affection could be truly styled neuralgic unless one or more of these tender points could be discovered; and he denied altogether the statement which up to this time had commonly been made, that pressure over a neuralgic nerve does not increase the severity of the pain. Other observers, seeing very plainly that many cases of neuralgia clearly do exist in which pressure over the points which I have enumerated does not cause or increase pain at all, have recently proposed to make two classes of neuralgiæ, between which the existence or non-existence of the painful points should form the line of separation.

"I feel some confidence in stating my opinion that neither of these views is strictly correct. In all the severest cases of neuralgia which I have witnessed from the beginning, equally with those of a milder type, there was not, in the first instance, any tenderness on pressure over any point in the course of the affected nerve. But in every case in which the pain assumes a certain intensity, and lasts long enough, there occurs more or less tenderness, and sometimes decided swelling and hypertrophy of the fibrous tissues with which it comes into the closest relations; and this, as a matter of anatomical distribution, is precisely what occurs at those points which Valleix so carefully indicated. It would be easy to show that these are situations at which the nerves divide into branches, which pass through the deeper layers of fibrous fasciæ to become imme-

diately subcutaneous. I believe, then, that it is the subacute inflammation, or at any rate hypertrophy, of these tissues which causes the formation of the tender points. This I am sure of, that in one case I have seen attacks of common migraine which were of longer duration than usual followed not merely by general tenderness of the forehead and scalp, but even by the temporary formation of an extremely tender supraorbital point, indistinguishable from that of the most undoubted neuralgia; and, in fact, the disease from that time assumed the latter type. And the cases in which the hyperæsthesia is most excessively developed at special points are precisely those inveterate examples of tic douloureux which occur in the decline of life: the longer these cases last, the more exquisite does the tenderness become. Moreover, it has been observed in the dissection of cases of inveterate neuralgia, that the hypertrophy of fibrous tissues, and even of bone, was principally developed around the foramina of emergence of the principal trunks of the nerve; and this agrees in a remarkable manner with the result of the experiments by Schiff and Mantegazza, to which I referred in my first lecture.

"I may notice here that Dr. Hanfield Jones, who has done so much for the investigation of nervous diseases, so far favors the above interpretation of clinical facts, that he speaks (in his valuable work on 'Functional Nervous Disorders,' p. 292) of some cases observed by Watson and Brodie (in which *the parts affected with pain at length became hot, swollen, and tender*) as marking a 'transition' from a paretic state of the cerebro-spinal nerves, merely, to a paretic condition both of these and of the adjacent vaso-motor nerves.

"The test of Valleix, therefore, although highly useful in its way, appears to be misleading when used in the sense in which he employs it. Its true use would rather seem to be as a prognostic of the severity and probable duration of the complaint, for there is no doubt that the long-continued existence of two or three or more exquisitely tender points is itself a very bad omen; and on the other hand, the rapid subsidence of this local tenderness is some evidence that the affection is mild, or at any rate is not far advanced.

"If these and the other arguments which I have previously used be just, there is then no need to draw a line of radical separation by refusing to consider the milder affections, which we call sick headache, or hysterical headache, or headache of debility, as nerve pains, though it may be well to keep the conventional use of the word 'neuralgia' for the severer forms of nerve pain. And on the other hand, in the instances (which I believe to be far more rare than many suppose) in which irritation transmitted from a distant organ is the exciting cause of trigeminal nerve pain, the fact is not to be lost sight of that in all probability the antecedent condition of the nerve itself is the most important factor in the product, which is pain. And as we are on the subject of diagnosis, it may be well to observe that nothing can be more objectionable than that kind of logic which, for instance, when a course of medication with some drug already ticketed 'emmenagogue' has simultaneously established menstruation and relieved a neuralgic pain, would therefore decide that the neuralgia had depended on 'uterine irritation.'

"With regard to the diagnosis between the various forms of trifacial nerve pain which are the subject of these lectures, there will generally be little difficulty if the characteristic features which have been already described are relied on as the main guide.

"And, finally, with regard to the diagnosis of the situation of the peccant point in the nerve in those neuralgiæ which presumably arise from an organic change: the result of the physiological considerations which I laid before you at our first meeting will convince you that the apparent situation of the pain will in reality tell you little. The physiological law by which sensations that originate even in the most central origins are nevertheless subjectively referred to the peripheral distribution of nerves makes it futile to draw inferences from the sensations themselves. Far more knowledge will, I believe, be gained by a careful study of those complications which I have endeavored to show you are not merely accidental attendants, but essential portions, of severe painful affections of the fifth nerve. The wider the area over which the secondary phenomena are scattered the greater the probability that the mischief is central, and has thus the greatest number of radiating channels for its secondary influence. And it is this principle which forces us, as I think, to place such affections as migraine and clavus in the same pathological group with the severest tic douloureux, and to separate them utterly from the headaches felt under circumstances of fatigue or 'biliousness' by non-neuralgic subjects. Contrast the dull diffused pain (bilateral, and felt nearly always most strongly at the back of the head) which is the simple result of indigestion, with the quick darts of agony, limited strictly to one nerve, and very generally to one division of it, which characterize a true migraine, or 'sick headache.' And observe, in the latter affection, how, as the severity of the pain increases, two secondary phenomena are developed at the periphery of two nerves which are widely separated except at their one point of connection in the medulla—viz., the secretory fibres of the fifth, and the vagus. The simultaneous disturbance of these two sets of nerve-fibres is plainly indicated by the occurrence of *intense lachrymation* on the one hand, and of *vomiting* on the other. But there is more to come on this subject of diagnosis which may be more conveniently taken under the head of Etiology and Pathology, because it is essentially mixed up with questions as to the hereditary transmission and transformation of disease."—(*Lancet.*)

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"*On Syphilitic Necrosis.* By Jas. E. Garretson, M.D., of Philadelphia.—The hard and soft palates seem particularly liable to suffer from attacks of specific disease, the venereal ulcer of these parts being looked upon as about the most common of the constitutional associations. That these ulcers are, however, strictly venereal, I am oftentimes led to doubt; certain I am that they appear and exist with greater virulence where mercury has been used with unnecessary freedom. Venereal ulcers of the parts are of two kinds: the superficial, and the ulcer of necrosis; either of them being very well represented in general appearance by the non-indurated chancre. The superficial ulcer may be found both upon the hard and soft palates, but is much more common to the latter. These ulcers—as the chancre—vary in size and character; being sometimes very amenable to treatment, at others resisting, and phagedenic, even to the destruction of the parts. Their treatment is to be conducted on general principles. I really know of few surgical conditions requiring nicer general judgment or more attentive care; it is to blow hot to-day and cold to-morrow, and *vice versa.* As a rule, these ulcers are found oblong in form; from an eighth to a half an inch in length; more or less excavated, the cavity being filled with a dirty,

white semi-solid paste. Their truest comprehension—my experience leads me to infer (as viewing them for treatment is concerned)—is found in considering them of scorbutic association.

"Touching them locally with the acid nitrate of mercury, or with a mixture of equal parts of iodine and creosote, not unfrequently causes them speedily to assume healthy action. I have never seen a case in which the internal exhibition of the mineral acids did not seem to be in some degree useful; and particularly have I found this to be the case where a phagedenic tendency existed. Whatever remedies, however, may be employed, the venereal basis of the trouble is always to be kept in mind. Syrup of the pyrophosphate of iron, conjoined with minute doses of corrosive sublimate and the iodide of potash, will, under certain conditions, compel these ulcers to disappear, as if by magic, particularly if locally some caustic be employed.

"The ulcer of necrosis, looking like the preceding, differs from it, in having some sinus leading from the pasty mass, which constitutes its apparent bottom, to dead or dying bone beneath. The ulcer in this case is not the trouble to be cured; and, indeed, could not, of course, be cured while the underlying disease existed. Ulcers of this class, being an attendant condition, are always situated over bone, generally about the suture of the maxillary and palate bones. They are always preceded by a tumid and engorged state of the part in which they are situated, indicative of the osseous trouble beneath. The character of this tumidity is always a matter of much concern; as in proportion to its solidity will generally be found the extent of destruction in the soft parts; the variability of this destruction is seldom, however, in proportion to the disease below. I have seen the whole palatine process die while the indicative ulcer has not been larger than the eighth of an inch in circumference; on the contrary, I have witnessed the smallest sequestrum attended with the largest ulceration.

"Incisions into and through this tumid engorgement will always be found satisfactory practice. The cuts are to be made, however, with judgment, always taking into consideration the vitality of the part. These incisions, if made through the periosteum, will frequently be found to exercise quite a controlling influence on the ostitis, just as in cases of ordinary necrosis, while their effect upon the soft parts is always for good. The treatment which should succeed the incisions is only to be determined by the circumstances of each particular case. Not unfrequently it will be found amply sufficient to keep the parts well cleansed, and await the coming away of the sequestrum; never, however, forgetting to meet the constitutional indication. In other cases—as when, for example, the phagedenic type is assumed—the most vigorous and well-directed treatment is necessitated.

"When cases are first seen in the open ulcerated condition, semi-indolent, as is frequently the case, I know of no treatment equal to packing in the ulcer cotton, saturated with creosote and iodine. I have had cases come to me for treatment, where the bone would be found exposed to the size of a silver three-cent piece, and where all the consequences of a large opening into the nares were to be apprehended, and yet, by such an application, repeated every other day, allowing the cotton to remain in the ulcer during the intervening time, I have, in the course of two weeks, granulated the denuded bone entirely over, and the parts have remained permanently cured.

"Breaks occurring in the hard palate, associating the oral cavity with the nares, are easily remedied by a covering of gold or silver plate. An impression of the full roof of the mouth is taken in wax. Into this plaster, in cream form, is poured ; to the coat thus procured is fitted the plate of metal, supported by the teeth, or by atmospheric pressure, precisely as in the case of a plate for the attachment of teeth. Any reasonably ingenious mechanical dentist can meet the indications.

"In breaks of the soft palate, there are few appliances better than a simple wad of cotton ; this may be changed *pro re nata.** Astonishing results in the way of diminishing or closing these breaks, both in the hard and soft palates, may not unfrequently be secured by freshening the edges, and touching every second or third day with zinc, iodine, or acid nitrate of mercury; great care, however, is to be exercised in this practice not to overexcite the parts, very ugly degenerating inflammations being sometimes the result of such stimulation.

"An ugly feature in the superficial syphilitic ulcer is its tendency to recur. The palate, looking perfectly healthy to-day, will assume to-morrow an indolent relaxed type, becoming semi-yellowish, some point or other will take on a fatty look, and in a few hours breaks down into an ulcer ; this may recur a dozen times ; the explanation is to be looked for in the systemic condition. An acid tonic treatment being generally called for. Such recurrence of the ulceration may extend over a period of six or eight months, in defiance of the most careful attention. I have certainly found it so in my own practice, and imagine it is a common experience. The salt bath in these cases will be found invaluable."—(*Med. and Surg. Reporter.*)

"*Eversion of Mucous Membrane of Upper Lip.* Reported by Dr. Napheys. Surgical Clinic of Prof. Gross, Jefferson Medical College.—Julia C——, aged twenty. Her upper lip is double. This defect is generally congenital. There is a protrusion of the mucous membrane, a redundancy, giving the lip a very curious sinister expression when she laughs. She first noticed it within the last two months. There is a hypertrophy of the mucous follicles in this situation, pushing the lip forward.

"The hypertrophied portion of the mucous membrane and subjacent structure was cut away by an elliptical incision, and the edges of the wound approximated by interrupted sutures, five on the right, and two on the left side. The sutures will be allowed to remain for four days."—(*Ibid.*)

"*A Mechanical Finger for the Microscope.*—This is the name which Mr. H. L. Smith, of Kenyon College, U. S., has given to a very ingenious mechanical appliance, which will prove a boon to those microscopists who are engaged in the study of minute hard structures. Since the mere description of Mr. Smith's invention occupies nearly three pages of *Silliman's American Journal of Science* (No. 123), we must refer our readers to this source for details. The instrument seems likely to be extremely useful in delicate manipulation, since it can be made to move about in every direction over the stage, and thus to convey minute objects from one part of the field to another—and this, too, with the greatest precision, and in the most gradual manner."—(*Lancet.*)

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* For Minute Paper on Palatine Defects, see *Reporter*, January 11, 1862; January 18–25; February 1–8–15.

"*The Hardness of Silver.*—Goldsmiths often complain of the hardness of silver, which is sometimes very difficult to carve, and presents a dead gray cut. These properties are generally attributed to the presence of a foreign metal; but M. Mathey, assayer at Locla, has shown that in this silver there is neither tin, lead, nor any other injurious metal. He considers this property to be due solely to the high temperature at which silver is cast. By letting the crucible cool till a slight solid crust is formed on the surface of the fused metal, and casting at this moment, a soft silver with a brilliant cut is obtained."—(*Dingler's Polytechn. Journal* and *Chem. News.*)

"*Silver and Gold Solution for Gilding Watches, Jewelry, etc.*—For silvering, add to a solution of nitrate of silver (made by dissolving silver in pure nitric acid) a solution of cyanide of potassium, until no further precipitate is formed, but not enough to redissolve the precipitate already thrown down. Pour off the supernatant liquid, wash with water, and then redissolve the precipitate in cyanide of potassium. The anode should be of silver. Should the solution change on keeping, add a little fresh cyanide. Use a moderate current. An ounce and a half of silver will give to a surface a foot square a coating as thick as common writing paper. For electro-gilding, the gold is dissolved in nitro-hydrochloric acid, washed with boiling nitric acid, and then digested with calcined magnesia. The gold is deposited in the form of an oxide, which, after being washed in boiling nitric acid, is dissolved in cyanide of potassium, in which solution the articles to be plated with gold, after due preparation, are placed. Iron, steel, lead, and some other metals that do not readily receive the gold deposit, require to be first lightly plated with copper, or dipped in a solution of silver, 1 part; nitrate of mercury, 1 part; nitric acid (*s. g.* 1·384), 4 parts; water, 120 parts. The positive plate of the battery must be of gold, the other plate of iron or copper."—(*Journal of Applied Chemistry.*)

"*Welding Composition.*—Mix borax with one-sixteenth of sal ammoniac, fuse the mixture, and pour it on an iron plate. When cold, pulverize it, and mix it with an equal weight of quicklime, sprinkle it on iron, which is heated to redness, and replace it in the fire. It may be welded below the usual heat."—(*Ibid.*)

"*Glazes.*—Common earthenware is glazed with a composition containing lead, on which account it is unfit for many pharmaceutical purposes. The following glaze has been proposed, among others, as a substitute: 100 parts of washed sand, 80 of purified potash, 10 of nitre, and 20 of slaked lime; all well mixed, and heated in a black-lead crucible, in a reverberatory furnace, till the mass flows into a clear glass. It is then to be reduced to powder. The goods to be slightly burnt, placed under water, and sprinkled with the powder."—(*Ibid.*)

"*White Paste which will adhere to any Substance.*—Make the following mixture: Sugar of lead, 720 grains; and alum, 720 grains; both are dissolved in water. Take 2½ ounces of gum arabic, and dissolve in two quarts of warm water. Mix in a dish 1 pound of wheat flour with the gum water cold, till in pasty consistence. Put the dish on the fire, and pour into it the mixture of alum and sugar of lead. Shake well, and take it off of the fire when it shows signs of ebullition. Let

the whole cool, and the paste is made. If the paste is too thick, add to it some gum water, till in proper consistence."—(*Ibid.*)

Cement.—According to the editor of the *Druggists' Circular*, "an excellent cement for luting chemical apparatus and for other purposes may be prepared by mixing paste made from starch with glycerin and gypsum. It will retain permanently its plasticity. By an addition of glycerin to glue (one-fourth part of glycerin to one of glue) the cracking and scaling off will be prevented. This glycerin-glue possesses also the property of caoutchouc to remove the marks of lead-pencil from paper."

Universal Cement.—It is stated (*Ibid.*) that a superior article of cement may be made "by mixing intimately 1 part of very finely powdered burnt gypsum with 3 to 5 parts of perfectly dry gum senegal, which compound should be preserved in well-corked bottles."

"*Glycerin Paste* for office use is prepared by dissolving one ounce of gum arabic and two drachms of glycerin in three ounces of boiling water."—(*Ibid.*)

"*Novargent.*—Under this name preparations are sold for resilvering plated articles from which silver has been worn off, and for coating copper and other metals with silver. They consist of a solution of oxide of silver in hyposulphite of soda or cyanide of potassium. Sometimes the solutions thus formed are mixed with prepared chalk, and sold in the form of power. The solution is rubbed over the metal to be coated with a little chalk; the powder is moistened with water or spirit, and then used in like manner."—(*Ibid.*)

"*Platinizing by Chemical Reaction.*—One part of platino-chloride of ammonia and 8 parts of hydrochlorate of ammonia are placed in a flat porcelain vessel, 32 to 40 parts of water poured over it, the whole heated to boiling, and the vessels of copper or brass, perfectly bright, are placed therein; they will be covered in a few seconds with a brilliant and firmly adhering layer of platina."—(*Ibid.*)

"*Test for Acids.*—An exceedingly sensitive test for ascertaining the presence of acids has been suggested by SCHONBEIN; this is simple cyanine blue, easily produced by the action of iodide of amyl on lepidine subsequently treated with soda. One part of the cyanine dissolved in 100 parts of alcohol is further diluted with twice its volume of water. The merest trace of an acid is promptly shown. Distilled water simply blown upon shows by this test the presence of carbonic acid from the lungs. The solubility of oxide of lead, which is so slight as to be unrecognized by sulphuretted hydrogen, is clearly discovered by this test. By carefully adding acid to the solution till the blue color is destroyed, a very delicate test for the presence of bases may be procured."—(*Sci. Amer.*)

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ORIGINAL COMMUNICATIONS.

LOCAL ANAESTHESIA IN EXTIRPATION OF THE DENTAL PULP.

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Notwithstanding the objections which have been urged by some practitioners against the employment of Richardson's Narcotic Spray-Producer, on account of unsuccessful results in their inexperienced hands (so far as the induction of anæsthesia is concerned), and the timid apprehension of such untoward sequences as sloughing of the soft parts, and exfoliation of portions of the alveolar process following the limited exposure to a depressed temperature, there can be no question that in such minor operations of surgery as the extraction of teeth, opening of alveolar abscess, the amputation of fingers, etc., it can be used with an entire exemption from pain on the part of many patients and without the slightest danger of the unfortunate consequences referred to, if employed, as all such agents should be, with skill and intelligence. That unfortunate results may be induced on the part of careless or ignorant persons is beyond a question of doubt true; it is important to remember, however, that all inventions and improvements in the arts and sciences are liable to opposition from misapprehension on the part of those who, failing to recognize the true value of a discovery, magnify all apparent and intrinsic defects. All new improvements require some experience before they can be used properly, and people of intelligence proceed with due circumspection under such circumstances, and thoroughly test before commending or condemning them. That distinguished observer and philosopher, Dr. Benjamin Franklin, announced over a hundred years ago that he could freeze a man to death on a warm summer's day through such an agency as the rapid evaporation of ether, and this remark may have suggested to Dr. Richardson the application of that substance in the

manner proposed in the production of local anæsthesia. Such a supposition may not be correct, but even if it is, it by no means detracts from the credit due to Dr. Richardson for his valuable invention and its application to the relief of suffering humanity, but on the contrary would indicate that philosophical cast of mind, which, reasoning from cause to effect, takes advantage of such a statement and makes a practical application of what thousands may have heard of and regarded as an interesting scientific fact, but at the same time wondered what use could be made of it. Men who take great credit to themselves for not being in the least degree visionary or theoretical, and pride themselves upon being pre-eminently practical men, from the fact of running in grooves, by doing as their parents, guardians, or preceptors taught them to do, are thus benefited by the theoretical men whom they affect to despise.

That there are some objectionable features connected with the instrument under consideration, which will prevent the universality of its application in the extraction of teeth, must be admitted; but these have been magnified by those who have had either a very limited experience in its use, or none at all.

My own experience has been by no means an extensive one, as my efforts are mainly directed toward the preservation of the dental organs; and the class of patients coming under my care rarely demands the use of forceps, but I have seen enough of the use of the instrument to recognize it as one of the valuable improvements of the age. In the early part of November a number of teeth (eight or ten) were extracted in my presence, for a female in the Infirmary of the Philadelphia Dental College, by one of the students. The etherial spray was employed to induce local anæsthesia, and the teeth were removed without the slightest manifestation of annoyance or pain on the part of the patient, and on arising from the chair, she stated no pain whatever had been experienced by her. Many other cases in which one or more teeth have been removed under similar circumstances, with the most favorable results, in the institution (where the invention is being thoroughly tested under the careful supervision of Dr. Stellwagen, Demonstrator of Operative Dentistry), might be cited.

A few days since, in operating on a right upper bicuspid, in which the dentine was so sensitive that the patient could hardly bear the contact of the instrument, I employed the etherial spray as suggested by a correspondent whose communication appears in this number of the Dental Cosmos, and found that the dentine could be excavated with no discomfort to the patient, immediately after the application had been made; as the sensitiveness, however, soon returned, an assistant was directed to keep up a gradual and steady current of the spray, and during the continuance of this, the cavity was thoroughly excavated without any painful sensations.

The success attending this, suggested to my mind the advisability of

employing the same plan in the extirpation of exposed pulps. In doing this, however, it will be advisable to exercise very great care, or the operation would be attended with a great deal of pain. The plan I propose is as follows: Apply in the first place a pledget of cotton saturated with chloroform for a few seconds, and then direct the etherial spray into the carious cavity (the first dash of which without such precaution would be likely to cause intense pain), and while the current is maintained by an assistant, carefully enlarge the opening into the pulp cavity, and as soon as the pulp can be touched without any painful manifestations, pass a barb broach into the cavity, rotate rapidly, and remove the pulp.

Cases may occur in which this course will not prove successful, but it is reasonable to infer that in many instances it will be attended with the happiest results, and obviate the necessity of the arsenical application. Several professional friends have promised to give it a faithful trial, and it is trusted that other members will do the same thing before condemning it as of no avail.

NECROSIS OF THE ALVEOLAR PROCESS, AND TREATMENT.

BY C. P. FITCH, M.D., NEW YORK.

Read before the Brooklyn Dental Society, June 27th, 1866.

Mr. President and Gentlemen:—In the examination of physiological and pathological subjects, one is brought directly to the consideration of laws or forces, which, in their essential nature, are occult. Therefore in the examination of the subject which engages our attention this evening, an investigation of the forces which dominate life action seems to lie at the foundation of all inquiry.

In order to assist in the conservation of any organized structure, a knowledge of the essential elements entering in and constituting its substance is no less necessary, than is a full and clear recognition of the forces that have, directly, to do with its increase, growth, or its decrease and death. It also seems quite important that one should be familiar with the modes in which such forces pronounce themselves, constituting the line of separation between healthy and unhealthy tissues; for the same force, but modified respecting its intensity, may, in one instance, tend to conservation, and may, in another instance, tend to destruction. Therefore, unless the character of the product, elaborated by the force, can be detected by observation and examination, or in other words, unless healthy growths may be distinguished from unhealthy, our vaunted aid will, in most instances, prove little more than meddlesome empiricism.

Necrosis is derived from the Greek verb *νεκροω*, which signifies to kill, and, when applied to bone, has reference to dead bone; therefore, *necrosis* of the alveolar process, the subject under present consideration, is the

product of devitalized bone. Its treatment is removal. Devitalized bone may be entire or partial: when entire, extirpation is the only remedy; when partial, revitalization is contraindicated.

The death of those bones constituting the sockets of the teeth may be rapid or slow: rapid, when the cause is referable to some constitutional vice, either hereditary or acquired, which interferes with the nutritive functions of a considerable territory of molecular life, and to traumatic lesion, lacerating and removing the parts by force; or slow, when the cause is due to the want or perversion of vital force, which is so apt to occur after the meridian of being is reached, especially where this condition is accompanied with the presence of an irritant about the necks of the teeth. As these processes naturally possess less vitality than most other bony portions of the body, they soon succumb to constitutional and local disturbances.

I wish to call attention to the fact that all functional action is molecular; and all molecular action is maintained by a certain expenditure of vital force; and the development of all and every structure constituting the entirety of the human body, involves a complication of vital acts, any one of which interfered with, may produce an anomaly in structure, or may incorporate into its interior being the seeds and elements of its own death.

Just how a poison or virus may affect these forces, and interfere with the nutritive acts, is a question which pathologists have not fully settled.

The histology of this subject I do not propose to speak of, further than to say that the alveolar process appears first in a semi-fluid condition, then cartilaginous, then osseous, constituting the bony surroundings of the teeth. Each of these physical conditions requires for its perfection of development the energizing presence of a vital entity. It will be perceived, therefore, how complex are the functions involved in the growth of a single tissue.

Again, the exhibition of appropriate aliment is absolutely necessary. This demand must be complied with in order that there may be produced a *properly organized* structure. The process is composed of animal and mineral substances, combined in definite proportions. In the death of this structure the cause must originate in the paucity of the material supply, it may be in character and quantity; or the cause may be found in the perversion or want of appropriate vitality. Whatever, therefore, be the general and exciting cause, it must pronounce itself ultimately in either of these ways, acting either directly or indirectly upon the structure.

The rational treatment of necrosis is suggested by the character of the part assailed, the constitutional condition of the organism, and the local causes directly involved in its death.

The treatment should be threefold. The suspension or negation of the cause; the removal, by gentle force or otherwise, of the parts already dead; and the revitalization of those portions partially dead as well as the reproduction of parts lost.

To effectually remove the cause of necrosis may require general as well as topical treatment. Whenever the disease is due to conditions of body, such as constitutional taints, hereditary or acquired, a course of general medication is absolutely requisite. Where due to abnormal conditions of teeth, or to the accumulation of tartar, etc. about their necks, our remedial efforts should be addressed to these conditions, not by removing the teeth, but by restoring them to soundness and the surrounding parts to health.

Whenever the death of the process is slow, occurring usually in persons of mature years, all local irritants should be removed and the necks of the teeth kept free from foreign substances. The gingival margins of the gums should not be too much excited by heroic brushing, etc., but moderate friction will be found highly subservient to the health and vigor of these parts.

For constitutional treatment, the remedies to be employed are diluents, alteratives, anti-syphilitics, diaphoretics, tonics, diet, exercise, air, etc.

For local treatment, escharotics, antiseptics, stimulants, styptics, demulcents, etc. may be required.

A removal of the sequestrum is necessary, either by arousing the *vis naturæ*, and thereby causing a line of demarkation to be set up between the living and dead parts; but if this method be found too prolix and exhausting to the patient, better remove the dead portions at once by gentle force: especially will this course be indicated wherever we have to do with dry necrosis. On the other hand, if the case under treatment be wet necrosis, or a sloughing condition of the surface of the bone, this condition should be changed by local dressings and by scraping the bone.

Whenever necrosis is due to the presence of an abscess and devitalized teeth, remedial treatment should be addressed to the abscess and to the preservation of the alveolar border and teeth. Professional gentlemen of our calling, at the present day, who regard the extraction of devitalized teeth the most effective treatment for alveolar abscesses and necrosis, are both to be pitied and censured: pitied for their inexcusable ignorance, and censured for their wholesale destruction of parts which are clearly and demonstrably salvable under proper medical management and a suitable regimen.

It would be much better for the credit of dentistry and the well-being of the community did such dental lights confine the exhibition of their skill and superior talents to much simpler operations. Indeed, words cannot be found in the English, or any other language, suitable to express the just opprobrium that should be meted out to all such living practitioners of dentistry.

In order to facilitate the reproduction of the alveolar borders, the attachment of the soft parts about the necks of the teeth should be, if possible, preserved. Wherever this condition is secured, the reproduction of the alveoli upon the roots of the teeth is quite possible; but otherwise I regard the reproduction a matter of impossibility. By the use of escharotics, stimulants, etc., a healthy exudation may be produced upon the surface of the bone under treatment. And if protected from the destructive action of the oral fluids, and if the cell action be not too rapid, but held in check by medical adjuvants, the resultant product may be developed into healthy bone tissue.

I will mention but one of the many cases which have come into my hands, within the last two years, for dental surgical treatment.

The person to whom I now allude is about thirty-five years of age. Nervo-sanguinous temperament. Was afflicted with four abscesses, all of which I cured in a few weeks of treatment, with the exception of the one which I will now briefly describe.

The abscess, when I first saw it, involved the root of the superior cuspidatus, left side, and those of the first and second bicuspids, also the floor and cavity of the antrum Highmorianum, and a portion of the nasal process of the superior maxilla. It was discharging through two fistulas over the roots of the cuspidatus and first bicuspid. The patient had been afflicted with this abscess for nineteen years. And all this time under the care of a dental practitioner. I have been treating the case about six months. The abscess was evidently caused by the devitalization of the teeth above mentioned. By general and local treatment, and by the removal of considerable necrosed bone, I have succeeded in producing an entire cure. The teeth have been filled and the necrosed portions have been restored, much to the gratification of patient and friends.

In conclusion, may I not hail the practice which has been inaugurated by this and other societies in the treatment of all such diseases as among the distinguishing features which characterize our progressive profession in this the latter part of the nineteenth century? And may we not hope that the advancement made in this direction, in the recent past, is but the dawn of that open vision which will soon bless the entire specialty?

GLASSES IN DENTAL OPERATIONS.

BY WM. H. ATKINSON, M.D., NEW YORK.

Read before the Society of Dental Surgeons of New York, June 20, 1866.

HAVING been appointed to write upon the use of glasses by those who make dental operations, I beg leave to say that what is said will be to conserve the eyesight, teeth, and truth, rather than to pander to pride, false opinion, and eclat. Just what was intended to be brought out by

the discussion of this question by the committee who selected it, is not now very clear to my mind. But desiring that the greatest good may come of all our deliberations, I propose to speak of the importance of a deeper insight into the structures of the teeth and their attachments than is attainable with unaided eyesight, be it never so acute.

Just here, let it be said, that mechanical execution of any design depends upon a nice conception of that design in its most minute proportions and detail. So he who best understands the design, structure, and intimate relations of the tissues of teeth will be best able to intelligently address his efforts to their conservation or restoration.

Until the microscope was not only invented (discovered), but made and applied to use, we had no real knowledge of any tissues, much less those wonderfully corelated elements out of which arise the tissues composing the field of our daily study and labor, viz.: the cement, enamel, dentine, and the pulp, from which they have their origin and support.

By the help of glasses, arranged in accordance to the laws of light and optics, we are now enabled to contemplate the effect of, if not actually see the mysterious agent at work, which brings these admirable structures from their unseen, amorphous state, into their tangible and beautifully pronounced state of useful, real proportions in their proper places in the living human body.

By a thorough study of the origin and character of each tissue of the teeth, as a distinct body, or as a part of the useful organ that is "nil" without them, no less than the peculiar manner of their union and blendings into one common body, we become acquainted with their relative importance and degree of life endowment, which might forever elude us without the use of glasses in the prosecution of our studies.

Thus instructed, the possibility of retaining a tooth in the socket, after the death and extirpation of the pulp, becomes apparent. In possession of the knowledge thus revealed, we are made aware of the territories occupied by these diverse tissues, and made capable of judging how far we may and how far we may not go in excavations with impunity.

He who would fully, nay, respectably understand how to make conservative operations upon the teeth, *must* be familiar with the *microscopical structure* of these bodies, if not their histology also. Neither of which can be attained without the use of good glasses faithfully put into requisition.

It will not be safe for the reputation of teachers in our specialty much longer to defer making these observations for themselves, and cease copying the bad work of their predecessors, with the hope of passing as deeply learned in this department.

If glasses are so indispensable to a knowledge of the origin and development and decadence of the teeth, are we not loudly called upon to go to work with them in earnest, to repeat and confirm, or upset the

doctrines taught upon this subject? No man pretends to depend upon the demonstrations of mathematics recorded in books until he has repeated and proved them to his own illumination and complete satisfaction. No more should we bow abjectly to even truth, clearly stated, until we are able to comprehend that it is really the truth in the case before us.

It has become fashionable to copy the cuts of Loewenhoek, Retzius, and others, without proving them; for no better reason than that it was cheaper and easier to copy these than to make original drafts of new specimens, the preparation of which demands some talent, some time, and some increased outlay to those who make books upon the subject. If men *must* make books for the professions, it becomes a serious duty to each profession to see to it, that they embody the highest pronouncement of the very latest developments in each department.

It is pertinent just here to ask, most earnestly and lovingly, how many of the thousands in our specialty are in any good degree conversant with the microscopic structures of the teeth? Were I to presume to reply to this important and searching query, it would be incumbent to say even teachers in our dental colleges are not *all* decently erudite upon this momentous "pillar and ground of the truth!"

If, then, this is so, with what face can we require it of those whom they graduate as fellows to be "up" to the "latest" and "best discoveries" in this respect, or turn upon them the cold shoulder of self-sufficient non-fellowship in the public and private walks of our specialty?

Nay, dear brethren, the light has come, and the time too has come, when we measure men not by what they already know, but by the *desire to know* all within the wide range of human and professional necessity! These and these alone are fit to commune with us in our own sweet fraternities and fellowships of a purely demonstrated knowledge, which makes every possessor thereof a "power" in the profession and in the world.

Hear me then with patience, when I earnestly plead with each one to rest not until he has commenced for himself the investigations of the wondrous base upon which our usefulness and happiness are built deep down out of the range of any vision not blessed with the enabling circumstance and condition of a good set of glasses!

The whole evening might be profitably spent in the advocacy of the use of the microscope as an illuminator of our understanding of the things with which we have to do daily. May the hope be indulged that the advice will be taken and followed in earnest, if I content myself by adjuring you to begin the work, and begin it now!

To speak at all to the point of the importance of glasses to the dentist, we must include in our catalogue not only microscopes, but pocket and hand-lenses, and spectacles, or eye-glasses, as they are sometimes ostentatiously denominated. This is a sensitive point I am well aware. But

why should any one be ashamed to use that which indicates that he is not, taking him just as he stands, the perfection of excellency (which would to God any had attained to, that we might have the pattern before us to copy as far as in us might lie!).

The mass of dentists never use a hand-lens at all in their examinations of mouths, and blunder woefully in consequence, sending away many teeth, that loudly demand intelligent interference, with the flattering assurance to their possessor, "your teeth are perfect!" and thus quieted, the poor deluded patient depends upon this broken reed of a judgment, but to be pierced through with many sorrows, sooner or later, as a penalty for easy confidence in a false trust.

It has been my lot to be acquainted with several men who persisted in doing their work without glasses, until the imperfect manner in which it was executed became apparent to them by the patients referring thereto, or the younger eye of an opponent had been careful to make it felt and seen, by both patient and practitioner, before they would admit the unwelcome fact that they were "getting old," and their "eyesight going from them." Thus stung into the acknowledgment of their need, they have come to the rescue and turned the tables upon ungenerous youth, by putting forth renewed energy, with increased diligence, with eyes made "better than new" by a good pair of spectacles. And ever after they stood pre-eminent in their neighborhood, because they had the humility to obey the laws of God, as displayed in the human organism, by despising the shame of "coming to glasses."

All who are determined to do perfect work only, will be convinced of the necessity of glasses, by proving the margins of their cavities, before and after putting in the gold, with and without a pocket-lens. Any filling that will not bear this test should be removed or repaired. Solid fillings alone stand the ordeal of finishing. He who makes faithful use of a good pocket-lens will best be able to judge when the sharpness of natural vision is not sufficient to enable him to make perfect work. No eye is so finely endowed as to take in the niceties of faithful excavations until it has been awakened by the use of magnifying powers of from five to fifty diameters.

After the mind becomes aware of the particular localities in which these little fissures most "do congregate," the ordinary sight is quite competent to ascertain just how far a fissure should be cut out, even before it assumes a softened or darkened condition, apparent to the patient.

One who has given much attention to the philosophy of eyesight, says "the eye sees only that which the mind conceives." This is eminently true in dentistry, especially in properly preparing and filling cavities in the teeth!

My advice to all men in general, and to dentists in particular, then is to educate the mind by the use of good lenses in the investigation of the

minutiæ of the bodies with which they have to do, and then put on spectacles just so soon as they cannot clearly see what they feel they ought to be conscious of being present by sight as well as mental conception.

Many regret beginning the use of glasses so early. Did you ever hear one regret that he had not continued to tax to the fullest extent his bodily ability when he found himself beginning to fail in strength? The argument is one, and the principle and advice ought to be the same in both cases, viz.: begin to conserve your powers of body before you are compelled to do it from sheer necessity!

A man can lift more with a lever or any form of mechanical power than he possibly can with the natural endowments of body alone.

If you err at all, be careful to do so on the side of safety and comfort, and thus you will live longer and do more good.

ANATOMY AND PHYSIOLOGY OF THE TEETH.

BY J. S. LATIMER, D.D.S., NEW YORK.

Read before the Brooklyn Dental Association.

The teeth of the lower animals are to them exceedingly important organs, serving not only as masticators, but as weapons of offense and defense; and in all there is a wonderful adaptation to the wants of the creature.

Thus the rodentia, as the hare, the beaver, and the marmot, with their sharp, chisel-shaped incisors, are exactly fitted for subsisting on the bark and twigs of trees; while the carnivora, with their strong and sharp teeth for piercing and tearing, are eminently adapted to preying upon other animals. The same wisdom is shown in the dental structures of fishes, serpents, and insects, of which it might be profitable to speak at some length; but I recall that I am confined to the human teeth, not the least wonderful, but the most abused of all.

Man's dental structure, according to the analogy of other animals, indicates that he was designed for a mixed diet of vegetable and animal food. Broad and sharp anterior teeth for incising (cutting), strong and moderately prominent canines for tearing; the carnivorous premolars and the broad, triturating and crushing true molars point unmistakably to this. But the *nursing* mammal has no need of teeth; hence man is born without them, or rather they are not erupted until several months after birth; and then he is supplied with only twenty, because the jaws are small and hence unable to accommodate large teeth, and because two sets will be none too many with which to grind during threescore years and ten.

Eight incisors, four cuspids, and eight molars constitute the deciduous

set. These teeth are less dense in structure, and have relatively much larger pulp than the second set possess.

They are erupted about as follows:

The central incisors,	5th to 8th	month.
" lateral "	7th to 10th	"
" first molars,	12th to 16th	"
" canines,	14th to 20th	"
" second molars,	20th to 36th	"

From the less prominence of the canines and the cusps of the molars, as compared with the second set, it would seem that the All-wise intended that the diet of childhood should be principally fluids and vegetables.

In process of time the jaws become large enough to accommodate the first true molars of the second set, and these teeth, the papillæ of which are first distinguishable at the sixteenth week of intra-uterine life, are duly introduced to the vicissitudes of this mortal existence. Ultimately the time arrives for the deciduous set to be replaced, and those that have not been prematurely shuffled off this mortal coil by some rude, meddlesome hand, lose their roots by absorption, and give place to the second set, which I wish I could truthfully call the permanent.

The order of this eruption is about as follows:

1st molars	from	5 to 6	years.	2d bicuspids	from	10 to $11\frac{1}{2}$	years.
Central incisors	"	6 to 8	"	Cuspidati	"	11 to 12	"
Lateral "	"	7 to 9	"	2d molars	"	12 to 14	"
1st bicuspids	"	9 to 10	"	3d "	"	17 to 21	"

This order is only an approximation to the average. I have known the canines to be presented first in the deciduous set. (My own child, now nearly seven and a half years of age, has the inferior central incisors of the second set, while the first true molars have not yet made their appearance.) The incisors, cuspids, and bicuspids have each one root, except the first superior bicuspids, which have two. The inferior molars have two, and the superiors three roots each. With the exception of the superior centrals, the roots are more or less flattened and often somewhat curved.

The roots are designated as follows:

First superior bicuspids, palatal and buccal; inferior molars, anterior and posterior; superior molars, palatal, anterior-buccal and posterior-buccal.

Every tooth may be said to consist of a crown, a neck, and a root or roots; the first being external to the gum, the second embraced by the gum, and the third imbedded in the alveolus.

With regard to material, it consists of enamel, dentine, cementum, and pulp; the dentine lying next to the pulp, with the cementum investing it on the root and the enamel on the crown.

The molars and bicuspids have each five surfaces and eight angles. The surfaces are buccal, palatal (or lingual), grinding, anterior approximal and posterior approximal. The angles are antero-buccal, postero-buccal, antero-palatal (or lingual), postero-palatal (or lingual), bucco-grinding, postero-grinding, antero-grinding, and palato-grinding (or linguo-grinding). The anterior teeth have a cutting surface instead of a grinding, and a labial instead of a buccal.

The teeth are supplied with nervous filaments from the fifth pair, and with blood from the dental branches of the internal maxillary artery.

The dental pulp is composed of arteries, veins, nerves, and intermediate substance; the whole, according to Sir Thomas Bell, inclosed by a thin, delicate, vascular membrane, closely attached to it by vessels. Some authorities insist that, besides this thin membrane of which mention has been made, another and thicker one lines the pulp cavity, and is firmly adherent to its walls. Harris not only claimed the existence of this membrane, but believed it to be the especial seat of inflammation which was styled endo-dontitis.

During the year 1860, a writer in the DENTAL COSMOS proposed to save this endo membrane alive, when filling pulp cavities and canals; I believe, however, he did not claim to have successfully accomplished such a result. The very existence of this membrane is now denied by men deemed good authority.

Microscopic observation shows the structure between the vessels of the pulp to be cellular, and these vesicular cells form the principal portion of the pulp.

The dentine (as it was first called by Owen) is more dense than cementum, but less so than enamel. Infinite numbers of tubuli, about a ten-thousandth of an inch in calibre, pass from the surface next the pulp out to the enamel and cementum. Whether vessels from the pulp traverse these tubuli, or whether they carry liquor sanguinis which has been exuded from the capillaries of the pulp approaching but not entering them, is not yet positively determined. It is hardly probable, however, that the tubuli are either lined with membranes or that vessels enter them, as they are far too minute to allow room for the walls of a vessel large enough to admit the circulation of the white corpuscles.

Besides the revelations of the microscope, dentine is proven to be penetrable by fluids by the reddish-brown appearance of teeth whose pulps have been disintegrated in closed cavities, as well as by the discoloration of the teeth of animals fed on madder. Cementum approximates the structure of bone much more nearly than does enamel or dentine. Though devoid of Haversian canals, it has the lacunæ and canaliculi, and receives its nourishment from a tissue corresponding to the periosteum of bones. It is endowed with a higher degree of vitality than either enamel or dentine. Enamel, though lowest in the scale of vitality,

exceeds both the others in density and hardness. It is composed of pentagonal, columnar crystals, resting one of their ends upon the enamel-seat (interglobular space) and extending the other to the periphery of the crown. The enamel, by thus opposing the ends of its crystals to external force, is rendered immensely strong.

It is the hardest substance in the animal economy. I have several times seen fire fly from it as from a stricken flint, while attempting to cut it with the excavators; and the finest steel, with the hardest temper, is required in excavating it.

It is claimed that the enamel is less dense when the tooth is erupted than it afterward becomes under favorable circumstances, and that this modification is produced by the infiltration of lime-salts from their solution in the saliva. However this may be, it is quite certain that *dentine* becomes more dense in time, probably from lime carried by the liquor sanguinis circulating in the tubuli. It has long been remarked that the teeth correspond with the general constitution in their color and structure: thus the bilious temperament generally carries strong, dense teeth, while the lymphatic provides comparatively frail osseous and dental structures.

It was suggested, at a late meeting of the New York Society, that, as the teeth originate from the skin, there might be a correspondence between the dermal and dental tissues on that account; nor is this view without some show of reason: the hair and nails are of dermal origin, and they are known to correspond with the skin. Thus, a person with auburn hair has a light skin and white teeth. The teeth of negroes are of opaque and milky whiteness, very different from the semi-translucent, bluish-white teeth of the Caucasian brunette, or the delicate, almost vitreous dentals of the blonde.

It is hardly supposable that the pigment of the skin exercises any controlling power in this direction, but it seems quite possible that other general characteristics may have their influence in determining the formation of the tooth. It is well known the exanthemata, or skin diseases, occurring during the formation of the enamel, produce atrophied spots and pits. To my mind, this fact is corroborative of the proposition assumed. All dentists are familiar with the fact that the teeth of different nations have characteristic peculiarities: instance the large, prominent teeth of the Irish and Scotch; the short, broad teeth of the Germans; and the fine, dense teeth of the French, Spanish, and Italians.

Americans, I am sorry to say, have irregular and comparatively poor teeth; not, as some have supposed, from the effects of the climate, for the aborigines were subject to the same climateric influences, yet had perfect teeth, but rather from the effects of a mixture of races and the artificial mode of life we have adopted.

With your indulgence I will go back a little, to notice a fact or two.

I remarked, in one place, that the dentine, in its first formation, encroaches more and more upon the pulp; and this is true, not only then, but during the entire life of the tooth. Hence we often find the pulp cavities and canals almost obliterated by deposits of secondary dentine; and hence the division of the canals of the molars, to which your attention has recently been called in the DENTAL COSMOS. These divisions are never met with in young teeth, but in old ones the inferior molars are frequently found with four canals.

One more idea, and I am done. I have observed that decayed and loose deciduous teeth are sooner replaced than those in a normal condition. This is acounted for by the fact that the irritation caused by the defective tooth invites a greater flow of blood to the part by which growth of the new organ is accelerated.

PROFESSIONAL FEES.

BY E. N. HARRIS, D.D.S., BOSTON.

An Essay read before the Massachusetts Dental Society, June 4, 1866, and, by request, read before the Connecticut Valley Dental Association, June 5, 1866.

(Concluded from page 174.)

I WOULD like to state here that I do not wish to be understood as censuring the moderate rates of fees charged by some, so long as they are kept anywhere within the scope of respectability, and where the services rendered do nothing to discredit the profession. It has been said that doctors never agree; but we must certainly give the medical profession the credit of agreeing upon one point, and that is in their union of action in relation to professional fees. Lawyers have also established regulations in regard to fees by which all the members of the bar are governed. I would like to see a tariff of rates established by this society, to go below which, except in the cases mentioned, shall be considered derogatory to the professional standing of any member, and a breach of fidelity toward his fellow-members, and a violation of professional honor, and, after proper investigation, if the charges be sustained against him, he shall deserve to be told that he is engaged in degrading the profession and that he must desist at once, or by the regulations of the society and of dental etiquette, be ruled out of our fellowship.

I am not one of those who would speak ill of others in our profession who have secured a higher appreciation for their services, in the shape of larger fees, than I am able to secure; neither would I class them among extortioners; I would rather speak of them and their professional success in terms of admiration and commendation, and press forward toward the satisfactory period when I hope to be even with them.

If there ever was a favorable time afforded to dentists to advance their

fees, it has been during the past four years, and if there are any who have not improved this golden (paper currency) opportunity, all I can say is, they have not acted wisely and are behind the times. And now that we have succeeded in getting the public in the way of rewarding us more liberally for our services, let no one go back one dollar, not a mill, but boldly and gentlemanly maintain our increased rates to all future time and generations.

I would not for a moment have the inclination or the presumption to put myself forward as an example for others to follow in the way of increasing the rates of compensation; but permit me to say that in this matter of fees, I began quite near the foot of the ladder, and since I located in practice in Boston in the fall of 1860, I have gradually increased my rates of charges, until now I charge double and often threefold as much as I did the first two years of my residence here, and my practice has all the while gradually increased, and my patients now really pay me with more cordiality than they did when I operated at the low rates; and I may state, as one of the results of my experience, that low fees are generally paid with less cordiality than high fees, from the fact that anything very cheap is usually considered very common.

I refer, therefore, to my own experience by way of encouragement to any who are desirous of increasing their rates, but feel doubtful about making the attempt lest it should not prove successful. I would say to such, make the effort, persevere in it, and you will certainly succeed. Some of your patients may leave you, but others will come in and more than fill their places. There are always some who will complain of the amount of their bills, you must expect that; but I tell such that I much prefer to have them find fault with my charges than with the quality of my operations. Let us perform our operations faithfully, then we can stand the test on compensation. In the course of time, many of those same persons who complained of the high fees, will acknowledge that they are fully satisfied, and that the benefits we conferred upon them have stood the test of time, and proved more than an equivalent for the amount of money compensation we received.

I would now like to say a few words in reference to fees for advice to our patients when no other service is rendered to them, which custom demands the attention of dentists generally.

It is an old and true saying, that "an ounce of prevention is worth a pound of cure." Professional advice, when heeded, is often of great value in preventing disease of the teeth, and thus saving to the patient much future trouble and expense. And yet the larger portion of dental practitioners make no charge for advice.

The uniform custom among physicians and lawyers is to charge for advice; in fact, that is the very thing for which they charge. Now this is the particular point of difference between a learned profession and a mere

handicraft. A public advertisement of "Advice free," by a physician or dentist, always emanates from a quack or mountebank, whose advice is worse than worthless.

We should not be so shy of charging for advice, we should instruct the public that our professional judgment, even if not accompanied by muscular action, is worth something; and that when a person calls upon us and requests an examination of the mouth and teeth, in order to be informed of their condition, or consults us in reference to having artificial teeth inserted, thereby expressing his confidence in us and his need of our judgment and opinion, he is expected to pay the counsel fee, even if there be no work for the hands to do—and precisely upon the same grounds that he would expect to pay a fee to a member of the bar or of the medical profession, if he applied to either of them for professional advice—and their time is no more precious than ours.

When this is adopted as a uniform custom in our profession, our patients and the public will inevitably come to the conclusion that we dentists have brains as well as the members of other professions, and that our learning and skill, and the power and ability to give a correct opinion on a case presented for our advice, have been acquired at the expense of toil, talent, and long-continued application, and also that our vocation is a profession, and something higher than a mere trade.

Another advantage we should derive from charging for advice,—we should prevent a great deal of the "shopping" and "marketing" that is now so much in vogue among many persons, and which encourages quackery and empiricism. For instance, when any of that class call—and you can generally discern them very soon after they enter the door—and request an examination of their teeth, and desire to be informed of the number that need to be filled, etc., and obtain your rate of fees for the same, and your advice, and then very graciously says that they guess they will go where they can get it done cheaper, just inform them that your time is valuable, and that you will be obliged to charge them a fee for advice. And in similar cases, where they come in to have the mouth examined, and to obtain our advice and charges in reference to inserting artificial teeth, and, after occupying considerable of our time, perhaps in the busiest part of the day, then say to us, that "Dr. So-and-so will make them a set for such and such a *price*," just pursue a similar course with them; and if the profession would only adopt this custom, we should soon put an end to this nefarious "shopping" arrangement, and we should also be remunerated for the time and advice given to them.

During the past two years I have pursued this course, and have been much gratified with the result; and I wish it might become a regulation among all dentists. It is frequently the case, that many of these same persons that go round from office to office in this manner, are abundantly able to pay a fair compensation for our services, which I have known to

be true in a number of instances in my practice, several of recent occurrence.

I would like to speak of another point, which I think ought to become a regulation among dentists, and that is, to make a charge in all cases for the operation of extracting teeth, whether the patient is intending to come and have artificial teeth inserted or not.

Many do not make any charge for extracting teeth where they are to make sets of teeth for the same person. I know of no good reason why such a course as this should be adopted. It is often a tedious operation to the dentist as well as to the patient, and frequently requiring considerable time and skill, where there are many badly decayed teeth and roots to be extracted. It is certainly a separate operation from that of having artificial teeth made and adjusted, as much so as the operation of amputating a leg, or hand, or foot, and having an artificial limb made and adjusted.

Why not charge for the surgical services as well as for the mechanical? It is the fault entirely of the dentists, that many of the people who come to us to have their teeth extracted, and their mouths otherwise surgically prepared for the insertion of artificial teeth, do not expect to pay any fee for it; or if the operator does charge for the operation, it is with the understanding that the amount paid shall be deducted from the amount charged for making the new teeth, and the fee of many for making sets of teeth nowadays is *so small* that, after deducting the fee for extracting, I hardly can see that there will be much of anything left with which to pay the rent of the office and buy provisions for the family. Now it has always appeared to me that this is a wrong and unnecessary custom that has somehow obtained among dentists, and ought to be abolished.

During the past three years, it has been my practice to charge for the extraction of the teeth as a separate operation, and I make no deduction of it afterward from the amount charged for the artificial teeth. I know that it is contrary to the practice of most dentists, but I think they make a great mistake in this respect. I hold out no inducements of this kind for patients to employ me to make their teeth, I consider it a distinct operation, complete in itself, and I charge for it as such; and if it is performed skillfully, we gain the respect and confidence of the patient, who will willingly pay this just fee, and will in most all cases return at the proper time and have the teeth inserted. In some cases they may complain a little of the charge; but after a brief explanation on my part they generally pay the fee with good grace. This has been my experience. Now and then some have applied to me, and after having learned my custom in this respect, have decided to go to those who will not charge anything for extracting their teeth, and I let them go, after receiving my fee for examination and advice; and occasionally I consider that I am

well rid of them, for generally those sort of persons are very unsatisfactory patients. I have known some of them, however, after they had gone somewhere else and had their teeth extracted and temporary sets inserted, to return and employ me to make their permanent sets—they in the mean time having got their eyes opened.

One other point: some operators in cases where they have filled several teeth for a patient, make no charge for cleansing or removing the tartar from the teeth, but "throw that in;" now this operation is oftentimes of as much or more benefit to the teeth than the filling, and when executed skillfully and judiciously, requires considerable time and patience, and I see no reason why our services in that direction should be rendered gratuitously. A respectable fee charged for this operation would, in the course of a year, amount to a large sum. From my observation during an active practice of over twelve years, I am of the opinion that, as a general thing, our patients are better satisfied, and have a higher opinion of us and of our services, when we charge them for every operation, and not endeavor to compliment them with gratuities, unless it be among cases of the worthy poor, who need and deserve favors at our hands, and whom we find a pleasure in relieving. For the poor we always have with us. The good Book says, "The rich and poor meet together: the Lord is the Maker of them all." "He that hath pity upon the poor lendeth unto the Lord; and that which he hath given will he pay him again." This subject of fees is intimately connected with the future welfare of our calling. To attract into the profession the best talent, there must be encouragement offered in the way of more liberal compensation. The laborious duties of the active practitioner, the prevalence of cheap dentistry and low fees, and the small prospect of future emolument, induces many of our young men of brilliant talents, whom we should like to have with us, to enter other professions, other vocations, instead of the profession of dental surgery.

While I advocate liberal remuneration, I am also opposed to the extortion of really exorbitant fees. Our society is growing in favor with the other professions and with the public, and is commanding their respect. Some of my patients and other persons make friendly inquiries of me about it, and express a lively interest in its prosperity, and when we consider that our society is not yet three years old, we can but feel gratified ourselves with its advancement.

I believe we are sufficiently strong now to inaugurate a reform in relation to fees, and a change in the customs I have referred to, and should we conclude, after due deliberation, to take any action of this kind, such regulations as we may decide upon should be made known to the profession throughout the State, which I think would have a good effect, and it seems to me it would be a movement in the right direction.

In conclusion, I would say that I think there are three things which have prevented the public from having that confidence in dentistry that they otherwise would, did not these difficulties exist. One is, so many poor and unsuccessful operations that are performed upon the teeth; another is, the habit that some dentists have unfortunately acquired of finding fault with all operations except those performed by themselves; and the third is, the great irregularity in the rates of fees charged by the profession here and in all portions of our country. Taking these three points into consideration, it is not at all surprising that the public are sometimes in doubt to know whether to place confidence in the profession or not; and I have sometimes wondered myself how they can be as liberal in their views toward us as they are. But there is much satisfaction in knowing that our dental colleges, our dental literature, and our dental societies, and the high positions that are being attained by many dentists at the present day, are gradually removing these obstacles to the progress of dental science, and if we but do our duty, we shall one day see the profession standing on equal grounds with the other learned professions in the land.

Gentlemen, if I have wearied your patience with my extended remarks, I trust you will pardon me, and attribute it to my zeal and devotion to our honorable profession. I close with a sentiment which, though it does not come exactly under the head of professional fees, yet it may be of interest to you. It was written by one of our most eminent contributors to dental science, and one who has labored through a long series of years to advance and elevate the dental profession. I refer to Prof. Thomas E. Bond, of the Baltimore College of Dental Surgery:

"There is a fount about to stream,
There is a light about to beam,
There is a warmth about to flow,
There is a flower about to blow,
There is a midnight blackness changing
Into gray;
Men of thought and men of action,
Lead the way!

"Aid the dawning, tongue and pen!
Aid it, hopes of honest men!
Aid it, paper, aid it, type,
Aid it, for the hour is ripe,
And our earnest must not slacken
Into play;
Men of thought and men of action,
Clear the way!"

PHOSPHATE OF LIME IN ITS DENTAL RELATIONS.

BY HENRY S. CHASE, D.D.S., IOWA CITY, IA.

I HAVE for a long time urged the folly of depending on the use of the *flour* of wheat for the NUTRITION OF THE TEETH.

In my paper on "Dental Hygiene," read before the American Dental Association, in Boston, August, 1866, I entered fully into the subject, showing the almost total want of the phosphates in fine flour.

As that paper was quite lengthy, I did not cite cases in Physiology or Pathology illustrating the facts insisted on.

I will now do so.

Mr. J., aged twenty-two, sanguino-bilious temperament. Has twenty-eight permanent teeth erupted. They are full size, well formed in shape, good color, and thoroughly calcified for his age, with perfect blending of enamel caps, and no signs of decay about them.

An older brother has also a *perfect denture* in every respect.

There are other brothers and sisters, who are said to have as good teeth as these which I have examined.

The father and mother of this family have hardly any teeth left in their mouth. They have been decayed many years; consequently these children would naturally *inherit* poor teeth. Now for the hygiene which prevented that calamity. During the infancy of some of the children, and before the two brothers, of whose teeth I have *particularly* spoken, were born, the parents moved to a new State, at the West, and were very thankful to get their wheat ground into meal for bread, as in the first settlement no bolts were put in the mills. A taste for unbolted wheat bread was then acquired, which has continued to the present, and no fine flour has ever been used in the family excepting on extra occasions.

The family have always enjoyed remarkably good health, which they attribute to their bread diet. Noticing a slight furrow across the labial surface of Mr. J.'s upper central incisors, I remarked to him that I thought he must have had a fit of sickness when between two and three years old. He said he did not know, but would ask his mother. His mother confirmed my conjecture, saying that he was sick about six weeks at the age above named.

Miss H., aged twenty, chlorotic. Has erupted twenty-eight teeth, are nearly all decayed. Have a pearly tinge; badly calcified; the sound dentine cut easily. I remarked to her that her "teeth looked as though she lived on fine flour bread and butter." She laughingly said, "that is the only kind of food I desire; I do live on it." She informed me that her sisters all had good teeth compared with hers; that they ate meat, potatoes, milk, etc.; that they laughed at her for her "Old Maid way of living."

Miss G., lymphatic temperament, aged thirteen. Has twenty-eight permanent teeth, pearly tint, fissures on crowns of molars and bicuspids, which are decayed, also on many approximal surfaces. The teeth cut soft. Mal-dentification.

I plugged fourteen cavities in her teeth.

Her father is a miller. The family use the finest of flour. This girl was nursed on milk made from fine flour. Her *teeth* were *starved* for the want of phosphate of lime.

The greatest mischief ensues to the teeth when the phosphate of lime is denied to the embryo and infant. If the mother does not replenish her blood with this substance as it naturally occurs in the food, the forming teeth of her child must inevitably suffer, and her own also. When we reflect on the enormous quantity of lime salts necessary to build up the bony tissues of a child until it is eighteen months old, and the waste of the same material which is daily excreted from the body of the mother and child, we may cease to wonder at the universal decay of teeth in Americans, and smother the sacrilegious inquiry, "Why did not the Creator make the teeth to last as long as the rest of the body?"

There is no need of relating more cases. I could do so by the hundred, for I have inquired of thousands of people in regard to their habits of life in relation to the teeth, and the story is nearly always the same.

NITROUS OXIDE GAS.

BY J. S. SCOTT, COBOURG, C. W.

THE great difficulty with nitrous oxide gas, as an anæsthetic for extracting teeth, met with, is on account of the effect passing off so quickly. I have repeatedly extracted from six to twelve teeth while the patient was wholly under the influence of the gas; yet where there are troublesome fangs to remove, more time is required. If it would be safe to administer it continously, for ten or fifteen minutes, an inhaler could he easily constructed by inserting a tube into each nostril, one with a valve opening invariably communicating with the gas receiver, the other with a valve opening outward, communicating with the atmosphere. By closing the mouth, the patient could not exhale into the receiver, nor inhale the surrounding air. The gas can be inhaled quite easily through one nostril.

The above is only suggestive. Reference to a few cases will give a better idea of my experience with nitrous oxide gas.

1st. August 10th, 1866.—Miss C., age 23. *Anæmic.* Her physician would not allow her to inhale chloroform. Administered five gallons gas. She proved restive, requiring great strength to restrain her movements, which were directed toward resisting the operation of extraction.

Plead that she was still conscious; wanted more gas. I directed an assistant to hold her hands, and removed one tooth. The effect of the gas passed off in a few minutes, when she was agreeably surprised to find she had lost a tooth.

September 9th.—Administered gas to same patient, with about same results; removed one tooth. She now says she did not feel either operation, and was not conscious of either tooth being removed until after the operation.

2d. July 21.—Mr. J. C., age 25, apparently healthy. Exhibited about three gallons of gas, when he become apparently unconscious. Allowed him to inhale two gallons more. Removed six teeth. He was perfectly manageable; apparently asleep. There was closing of the mouth, as sometimes occurs with chloroform. He said he was conscious that his teeth were being removed, but could not resist; thought only one was removed; *felt no pain.*

3d. Mr. J. B. D., age 30. Inhaled three gallons. I removed one tooth. He did not resist; said he felt the operation, but realized scarcely any pain.

4th. August 21st.—Mrs. Rood, N. H. H., age 50, healthy. Exhibited five gallons of gas. She was apparently unconscious after she had inhaled three gallons. Removed eleven teeth. She said she felt the *last one only,* and thought that was the commencement of the operation. She remained apparently unconscious about two minutes after the last tooth was extracted.

5th. September 27th.—Miss E., age 24. *Anæmic.* Subject to fainting. Became apparently insensible when she had inhaled about *one gallon* of gas; removed two teeth. She was perfectly unconscious of the operation.

6th. September 29th.—Mr. J. P., apparently healthy, age 30. Subject to asthma. Upon the first inhalation of the gas, he strangled; appeared to suffer pain; inhaled two gallons; was apparently unconscious; removed part of a fang. He felt the operation slightly.

7th. September 17th.—Mrs. P. S. D., age 35, healthy. Inhaled four gallons. Extracted *nine teeth without any pain.*

8th. September 29th.—Mrs. N., age 30. Has had disease of the heart six years. By advice of her physician, who was present, administered four and a half gallons gas; removed ten teeth. She was conscious of the operation, but felt no pain.

Many of the above were from the country, and had to return by carriage after the operation, which they were able to do without any difficulty from exhaustion.

A METHOD FOR REMOVING TEETH FROM VULCANITE PLATES.

BY E. C. WADSWORTH, SAUQUOIT, N. Y.

In the June number of the Dental Cosmos, I notice a plan for removing teeth from rubber plates. I have been employing a method for the last three or four years by which a set of teeth can be removed from an old plate in five minutes from the time of taking the case up, and with an outlay of less than one minute's actual labor. If your correspondent will give it one trial, I am convinced that he will abandon his plan of cutting a groove over the heads of the pins, filling with oil, etc.

My plan is as follows: place the case in a dish of dry sand, taking care to have every part completely covered, and set in a hot oven or over a gas-burner, and within five minutes the teeth can be picked from the plate easier and cleaner than from a trial plate of wax, without smell, and no danger of breaking.

For making air-chambers, I use pattern tin, folded as many thicknesses as I wish my chamber deep, usually from two to four, trim in shape, press to its place on the model and finish by brushing a thin coat of collodion over the entire surface.

OBTUNDING SENSITIVE DENTINE WITH THE SPRAY-PRODUCER.

BY J. R. FINNEY, YOUNGSTOWN, OHIO.

I have been experimenting with the narcotic spray-producing apparatus upon sensitive teeth, and find that I can successfully clean and fill those teeth that have heretofore given so much pain to the patient and trouble to the operator.

The spray is first applied to the gums, and then gently at first upon the tooth or teeth to be operated upon. The patient experiences little or no pain from the chilling, while the excavating is rendered painless. I have treated some twenty-five cases in this way with success. The worst case was a young man of a very nervous temperament. The right and left inferior centrals and right cuspid, with the decay partially under the gum. He could hardly bear me to touch them; he did not mind the cold of the spray after the first dash. Insensibility in the teeth was soon induced, and I removed the decay and filled the cavities without pain, and to his entire satisfaction.

PROCEEDINGS OF DENTAL SOCIETIES.

PROCEEDINGS OF THE ODONTOGRAPHIC SOCIETY OF PENNSYLVANIA.

BY THOS. C. STELLWAGEN, D.D.S., A.M.

A MEETING of the Society was held on Monday, September 3d, 1866, in the Philadelphia Dental College Building.

Dr. J. M. Harris, President, in the chair.

The minutes of the meeting of June were read and adopted, and those of the *annual* meeting were read for correction.

Drs. J. N. Wunderlich and Wm. C. Head were unanimously elected as *active* members.

Prof. J. H. McQuillen then proceeded to show, under the microscope, some very interesting specimens of interglobular spaces in dentine, in which the passage of the dentinal tubuli across the interglobular spaces was acknowledged by all present as plainly evident to them. Considerable discussion supervened as to the effect of these spaces upon the teeth.

The Society then adjourned.

A meeting was held November 5th, 1866, at the usual place of meeting.

Dr. J. M. Harris, President, in the chair.

The minutes of the preceding meeting were read and adopted.

The following lecture was then delivered on

"MICROSCOPICAL PHOTOGRAPHY."

BY ALBERT R. LEEDS, A.M.,
PROFESSOR OF CHEMISTRY IN THE PHILADELPHIA DENTAL COLLEGE.

I am desirous of bringing to the notice of the Odontographic Society, this evening, a new method of taking microphotographs. The light employed is not natural, but artificial; it is not derived from the sun, but is known as the calcium, or, more properly, as the lime light. And, in the first place, a few words as to the mode of obtaining and of managing properly this light may be acceptable.

You see in front of the lecture table a copper tank and bell, from which a constant and self-regulating supply of hydrogen gas is flowing, and alongside of this self-regulating reservoir of hydrogen, there is, as you notice, an India-rubber bag, which contains about twenty gallons of oxygen gas, and which can be subjected to any desired pressure by placing weights upon the upper leaf of the press-boards. When it is desired to obtain the most brilliant light, the water in the tubes of these gauges should stand at eighteen inches, which would correspond to a pressure of three-fourth pounds per square inch. The oxygen is made to issue in this

fine jet, and is surrounded on all sides by the hollow cone of burning hydrogen. The heat evolved by the chemical union of the best combustible, and the best supporter of combustion, is very intense, and would rapidly burn up a piece of iron, and melt a good sized lump of platinum. But with all this heat there is very little if any light. If, however, a cylinder of quicklime be introduced into the flame, the lime is heated to intense whiteness, and sends out rays of such brilliancy as to dazzle and pain your eyes when I direct the light into the room.

You notice that there is no burning of the lime; there is no shifting in this case, as there is with the magnesium light, of the source of light-rays from the burning away of the combustible body.

The light proceeds from a minute point, and when that point has once been properly adjusted in front of the condensing-lens, the photographer may dismiss all anxiety as to the focussing of the light for a long time. At home, I bring this lime light, this artificial sun, into the dark-room, and the chemicals, sink and tap, being also right before me, it is thus possible, without moving a step, to take any number of microscopic photographs, at any hour of the day or night.

An ordinary microscope, as you are all well aware, consists of three parts: a mirror for reflecting the light and condensing it upon the illuminated object, an object-glass for increasing the divergence of the rays, and thus increasing the apparent size of the object, and of an eye-piece for viewing the magnified image so formed and of bringing it to a focus upon the retina of the eye.

In this gas-microscope, the mirror is replaced by the rays of light which proceed from the highly heated point of lime, and are concentrated upon the object by a variety of condensing lenses. The stage for supporting the objects, and the object-glass, are the same as those of an ordinary microscope.

But the eye-piece is omitted altogether, and the photographer projects the magnified image directly upon the sensitive film. Before proceeding, however, to take a photograph, it will perhaps be interesting to view a number of microscopic specimens, highly enlarged and projected upon the screen.

[Many beautiful preparations, which had been kindly furnished for the purpose by Dr. McQuillen, were then exhibited upon the screen, and, in response to a request, were described by him. They consisted of sections of the teeth of different animals, and of the human teeth in various directions, and the distinctness with which the various points were brought out upon the screen commanded the hearty commendation of all present. A general wish being then expressed that Prof. Leeds would take a photograph in the presence of the Society, he made a different arrangement of the apparatus, and, after a delay of some minutes, proceeded as follows:]

I have now placed in front of the object-glass, and parallel with the

object, a ground-glass plate, upon which to focus the magnified image. The frame which holds this plate of ground-glass is supported firmly upon a base, and yet, by means of these grooves, its distance from the object-glass may be varied at will, and a picture of any desired size may be taken. We will select as an object, this longitudinal section of a central incisor, prepared by Dr. Flagg. The glass employed in taking microphotographs should be of the finest character, and its surface should be rendered clean, and polished with the utmost care. We will now pour over such a plate, of about six and a half inches by eight and a half inches, some collodion, which holds in solution a certain amount of the iodide and bromide of ammonium. The plate is rocked backward and forward, in order that the film which forms by the evaporation of the ether of the collodion may be free from all streaks, and as even as possible, and the excess of collodion is drained off from one corner of the plate, and poured back into the bottle without spilling a drop. As soon as the film has hardened sufficiently to bear the impress of the finger without sticking, the plate is lowered into the bath of nitrate of silver. A chemical change is now taking place between the nitrate of silver in the bath and the iodide of ammonium in the film, and, as a result, there is formed the nitrate of ammonia and the iodide of silver. The former goes into solution in the bath, the latter remains upon the surface, and throughout all the texture of the collodion film. At this stage of the process, it will be necessary to lower the lights, as far as possible, in order that the plate may not be blackened by extraneous light when removed from the bath.

We may now safely draw the sensitized plate out of the bath, and opening the lid of this box, we will place the plate on four little glass rests, situated on the inside of the box. This box is then slid into the frame which carried the ground-glass plate, and it has been so constructed that the surface of the sensitive film now occupies precisely the same position as the surface of ground-glass did previously. Consequently, whatever image was accurately focused upon the latter will be sharply defined upon the surface destined to receive the photographic image. But the rays of light are now prevented from reaching the plate by this slide which forms the other side or the front of the box. We will now remove the slide—one, two, three, four, five, six, down the slide goes, and an image has probably been formed in this short space of six seconds upon the plate. But on removing the plate from the box, the collodion still presents a white creamy surface, and to all appearance has not been acted upon at all. The particles of silver in the film *have* actually been acted upon by the light, an image has been formed, but this image is latent, or invisible. Now, however, I will pour over this invisible image a developer, as it is called, a solution of the sulphate of iron.

[A very strong picture was at once obtained, and on being held up in front of the light, was highly commended by the members present.]

On a future occasion I hope to present a number of such microphotographs upon glass, and by employing them as pictures in the magic lantern, to exhibit the original objects magnified many hundred times in diameter, and with such strong relief of light and shade, as to form very useful aids to the lecturer or student of dental microscopy.

TRANSACTIONS OF THE BROOKLYN DENTAL ASSOCIATION.

BY DR. W. C. HORNE, NEW YORK.

After an interval of nearly three months, the Association recommenced its fortnightly sessions, on Wednesday, the third of October.

The officers for the year are:

President.—Dr. W. C. Parks.

Vice-President.—Dr. A. C. Hawes.

Corresponding Secretary.—Dr. W. H. Atkinson.

Recording Secretary.—Dr. W. C. Horne.

Treasurer.—Dr. J. S. Latimer.

The opening address, embracing a retrospect of the proceedings during the past year, along with some suggestions for an enlarged sphere of usefulness on the part of the society, was made by Dr. W. C. Horne, a copy of which was requested for publication.

The Association met October seventeenth, at Dr. G. A. Mills' house.

The Secretary was instructed to decline the offer of the New York College of Dentistry, that this Association have the free use of the college lecture-room; the Association preferring to maintain its present course of meeting at the houses of its members.

Dr. Wm. C. Horne opened the discussion for the evening by reading the following paper on

"ANÆSTHESIA."

Mr. President and Gentlemen:—The subject of anæsthesia claiming our thought to-night, I shall ask your attention only to its more recent phases, having on a previous occasion laid before you a summary of the advances made in the use of anæsthetic agents since the first application of nitrous oxide for this purpose by Wells, down to the date of its late revival.

During the past year, very great interest has been excited in the discovery by Dr. B. W. Richardson, of England, well known to us by his Lectures on the Teeth, of a new method of producing local anæsthesia, by directing on a part of the body a volatile liquid having a boiling point at or below blood heat.

For this purpose Dr. Richardson prefers absolute ether, dispersed in the form of spray, by means of an instrument which you have all seen; the result is rapid evaporation, and so great an evolution of heat force from

the surface struck, that the blood cannot supply the loss, and the part for the moment becomes insensible. As soon as the external agency is withdrawn, the blood returns through the insensible parts and restoration is immediate; the extreme rapidity of the action being the cause of its safety. Dr. Richardson announces, as a new truth, that the principle of general and local anæsthesia is identical: in the first, the brain is cut off from the local part, and in the other, the local part is cut off from the brain.

The difficulty of procuring ether which will bear the necessary tests of purity, such as boiling in the warm hand, leaving no odor on evaporation, and being neutral in its reaction, has induced the use of rhigolene, obtained by distillation of petroleum. It is a hydrocarbon, wholly destitute of oxygen, and said to be the lightest of all known liquids. Professor H. J. Bigelow, of the Massachusetts Medical College, says that freezing by rhigolene is far more sure than by ether, as it boils at 70°, whereas the boiling point of ether is 96°; that it is more easily controlled, quick in its action, and may be made inexpensively. It is not odorless, but has some of the peculiar smell of the oil from which it is derived.

Professor Vander Weyde has brought to the notice of the profession a liquid boiling at from 60° to 30° Fahrenheit, which he has named chimogene—cold generator—this causes, by evaporation, most intense cold, and is, in his opinion, superior to any of the other substances used. Changes in the volatile fluid of course make no change in the principle of the process.

In the application of local anæsthesia, the first degree of congelation is evanescent; if protracted, it is followed by redness and desquamation; if continued, or used on a large scale, the dangers of frost-bite and mortification are imminent.

This process is found to be very useful in stopping the flow of blood from venous and capillary vessels, and even from small arteries; in this particular it might be applicable to severe hæmorrhage after extraction of teeth. While Dr. Richardson's discovery is very generally received by the medical profession, and its success may be considered as established in minor surgical operations, it is not likely to prove of any great value to the dentist. It is only applicable to the upper front teeth. In the others, the accumulation of saliva, movements of the tongue and cheek, with restlessness caused by the entry of the spray into the throat of the patient, render its continued application seldom possible. When a part is to be frozen, it should be previously carefully dried, otherwise a film of ice forms and prevents anæsthesia. This, together with the pain caused by the coldness of the application, cannot but be great obstructions to its adoption by dentists.

The use of nitrous oxide has of late been greatly increased. No longer confined to the hands of charlatans, it has been tested and approved by men of eminent scientific ability. Great improvements have been made in the manner of its administration; the evident defects in the old pro-

cess of repeated inhalation from a vessel containing constantly deteriorating material has been overcome.

The mechanical means by which this desideratum is attained will be found lucidly described in a handsome little work, entitled Instructions in Nitrous Oxide, by Dr. G. T. Barker, of the Pennsylvania Dental College, which has received general commendation from the medical journals of the country. To the same source I am indebted for many of the ideas communicated in this paper.

You are all familiar with the beautiful apparatus devised by Professor Vander Weyde, in which he provides for the absorption of the inhalations from the lungs, chiefly carbonic acid gas, by passing them through caustic solutions before their return to the gasometer.

This gentleman has since prepared nitrous oxide, liquefied, at a temperature of 30° Fahrenheit, by a force pump of a power of 32 atmospheres. The benefits of the liquefaction are absolute purity of the material, and its capability of indefinite preservation in a metallic cylinder of small bulk. Should experience favor this method, it will obviate the chief objections to the use of this anæsthetic.

For the production of anæsthesia, nitrous oxide should be administered unmixed with atmospheric air. This is insured most perfectly, so far as my observation goes, by the use of a cap of flexible rubber (devised by Dr. Barker) covering the mouth and nose of the patient, and which holds closely to the face, effectually preventing leakage at the corners of the mouth. Provision is made for maintaining the purity of the gas by an invention of Dr. D. H. Goodwillie, consisting of two valves in the stop-cock, one opening inward only on inspiration, and closed by the force of the exhalation, which opens and passes out of the second valve. A rubber bag connected by a tube receives the exhaled gases, which, if desired, may be purified, and the remaining nitrous oxide returned to the gasometer. The hard rubber inhaling tube is arranged to slide from the mouth-piece in case of forcible closure of the teeth, leaving room for the use of the forceps.

By another improvement, the unsightly inhaling bag is dispensed with, and a simple rubber tube conducts the gas from the reservoir to the mouth of the patient.

Dr. O. A. Jarvis strongly advocates the administration through the nostrils; the advantage of which he claims is that the mouth may be opened at any stage, while breathing through it may be easily prevented. I can conceive of cases in which this mode would be difficult, if not impossible.

The difference in the appearance of persons inhaling pure nitrous oxide from a properly constructed apparatus, and of those who breathe the same vitiated gas over and over again from a small bag, is hardly conceivable by those who have not witnessed the experiment. My attention was first called to this during the present summer, when I saw a number of badly decayed and some hypertrophied teeth extracted from

the mouth of a strong built man, who, during the operation, remained in a perfectly tranquil sleep; so marked, indeed, was the absence of the suffused appearance of the face and so natural was the breathing, that I concluded at the moment of commencement that the gas had failed to have any anæsthetic effect. But I was convinced to the contrary by his continued tranquillity through what would otherwise have been a most painful operation, and by his own subsequent testimony.

The anæsthetic properties of nitrous oxide are due to stimulation, differing in this respect from ether and chloroform; while patients rarely feel any depressing effects after it. It is unaccompanied by emesis, unless taken immediately after eating; and its influence on the system passes off entirely in three or four minutes after inhalation, insensibility being rarely extended longer than a minute and a half. Dr. Barker considers nitrous oxide contraindicated in cases of seriously diseased heart, or in active congestion or acute inflammation of the heart, lungs, and kidneys.

Its chief danger consists in the rapid elimination of carbonic acid gas, which is not all expelled at expiration. This requires constant watchfulness against carbonization of the blood.*

Especial attention is due to the experience of the most reliable administrators, that nitrous oxide may be kept without deterioration over water in a metallic tank for a number of days, so that the advantages held out of having "the gas fresh every day," are illusory. Passing it through a large body of water is the best means of purifying this gas; the solutions used in Wolfe's bottles soon become saturated, after which they will take up no more impurities.

The use of this agent in capital surgical operations is becoming frequent, having won the confidence of some of the most eminent American surgeons. Its abuse in the wholesale extraction of teeth, which might be preserved by competent skill, cannot be too highly condemned; in its legitimate use it is a valuable beneficent agent. In competent hands it is safe; with the reckless, anything capable of profoundly affecting the human organization may be made the means of doing much harm. Its excellence in our specialty is now acknowledged almost to the total exclusion of other agents; time, that great leveler, will confirm or annul this decision, on a larger return of evidence.

Dr. Hurd condemned very strongly the reckless manner in which nitrous oxide was given by certain parties, who claim that out of thousands of cases, in no instance had any bad effects followed their administration.

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* "It increases oxidation of the fluids and solids of the body, and also acts as a stimulant to the brain and nervous system; where there exists any prior disposition to congestion or inflammation, the administration of nitrous oxide may develop this latent tendency, and a fatal result ensue. Its advantage over other anæsthetics, even in the morbid conditions referred to, consists in the fact that being so rapidly absorbed, any bad effects can be quickly detected, while its rapid elimination from the system favors a speedy recovery."—*Instructions in Nitrous Oxide*, p. 55.

Dr. Fitch had no personal experience in it, but the fact that it was used very extensively and without fatalities, commended its safety. His own use of anæsthesia had been chiefly confined to a mixture of ether and chloroform, with which he had been very successful.

Dr. Latimer condemned the use of inhaling bags without the improved mouth-piece.

Dr. Franklin claimed for Dr. Richardson's method, that it should be thoroughly tested, as he believed it capable of extensive application to dental practice with good results.

Dr. J. H. Smith stated that he had administered nitrous oxide very largely, and had himself breathed the gas times without number; he found it safe and agreeable; he used an inhaling tube, which carried off the expired gases, and considered it an indispensable part of the apparatus.

At the close of the discussion, the following resolution was adopted unanimously:

Resolved, That this Association condemns the practice of administering nitrous oxide gas from any inhaler which requires the patient to breathe again and again the expired effete matter and gases.

The subject for the next meeting will be the Code of Ethics of the American Dental Association.

CONNECTICUT VALLEY DENTAL ASSOCIATION.

THIS Association began its fourth annual meeting at Springfield, Mass., Tuesday, October 30th, 1866. The following members of the Association were elected officers for the ensuing year:

President.—Dr. L. D. Shepard, of Salem.

Vice-Presidents.—Drs. A. A. Howland, of Barre, and H. F. Bishop, of Worcester.

Secretary.—Dr. W. H. Jones, of Northampton.

Treasurer.—Dr. A. F. Davenport, of North Adams.

Executive Committee.—Drs. O. F. Harris, of Worcester; T. W. Meekins, of Northampton, and A. B. Cowan, of Palmer.

The retiring President, Dr. J. Beals, of Greenfield, made an excellent address, reviewing the progress of the profession during his long practice, and embracing many facts both interesting and of eminent importance to members of the profession.

Dr. Shepard, on assuming the duties of his office, thanked the members for their many tokens of confidence, and congratulated the Association on its great prosperity—its membership having increased in the three years past from eighteen to seventy-seven—and on its influence in elevating the standard of professional education throughout the Connecticut Valley, as shown by the fact that five of its members have closed their offices and pursued the collegiate course since the formation of the Society; and that twice the number of copies of the professional magazines

are now taken than then. A proportionate increase in skill is also to be noticed, and is a direct result of the influence of the Society.

The remainder of the afternoon session was occupied by a discussion of the "Comparative Value of Soft Foil and Adhesive Gold in durability of Results." This discussion was opened by Dr. I. J. Wetherbee, of Boston.

The evening session was well attended, and the afternoon subject was continued, occupying all the time until adjournment. Late in the evening the meeting broke up, and the members were agreeably surprised and entertained by a bountiful collation provided by the proprietors of the hotel.

The meeting for the next day was at 8 A.M., on Wednesday. The first exercise of the forenoon was a clinic before the Association, by Drs. I. A. Salmon, J. N. Davenport, and A. F. Davenport. The first topic under discussion was "Nitrous Oxide and other Anæsthetics," and it was opened by an essay read by Dr. George Bowers, of Springfield, Vermont, and participated in by nearly all present.

The following resolution was then passed by unanimous vote:

Resolved, That this Association do not consider the nitrous oxide made by Sprague's arrangement any purer than may be produced by the apparatus not interfering with his patent, which applies only to the convenience of the operator in regulating the flame.

Dr. Salmon, of Boston, then read an essay on "Conservative Dentistry, or the best means for accomplishing our great aim, preserving the greatest number of natural teeth."

In the afternoon the code of ethics adopted by the American Dental Association at their last meeting was taken up and unanimously adopted for the government of this Association. Alveolar abscess was then discussed ably and fully by many of the members.

The following essayists were appointed for the next session: Drs. A. A. Holland, of Barre; H. Wheeler, of Holyoke; T. W. Meekins, of Northampton, and Jairus S. Hurlburt, of Springfield, Mass.

An improved head-rest was exhibited to the Association by Dr. O. C. White, of Hopkinton, its inventor, and was generally approved.

It was voted that the next session of the Association be held at Northampton, on the second Tuesday in June, 1867. Adjourned.

EDITORIAL.

THE GOODYEAR DENTAL VULCANITE COMPANY.

The dental profession all over the country appear disposed to contest the validity of the claim which the Vulcanite Company has recently put forth (based, to a certain extent, upon an agreement between the company and a committee appointed by the American Dental Association to confer with them on the subject), and combinations have been formed in

different States for the purpose of securing legal advisers, etc. for those who may be prosecuted by the company, and with the determination that if the decision should prove adverse to the profession in test cases in the United States District Courts, to carry the matter to the Supreme Court at Washington, the decision of which is of course final and binding.

With no desire to reflect upon the worthy gentlemen who composed the committee of the Association (for they are entitled to all respect, as high-minded and honorable men), it is not a matter of surprise that the terms agreed upon between them and the Vulcanite Company should have been so thoroughly repudiated by the profession, for the tax to be levied, even if its legality should be decided, is a most exorbitant one in the aggregate and in detail.

When it was proposed, the evening before the American Dental Association assembled in Boston, to bring the matter before that body, in conversation with a number of gentlemen, I protested against such action, giving as a reason that the members present had come from a considerable distance to engage in deliberations relating to the science and art of the profession, and that the introduction of this subject would be very likely to interfere greatly with the primary object which had brought the members together, and without effecting any definite, final, or satisfactory adjustment of this matter. The impression thus advanced was fully realized when the subject was introduced in the Association, for, like Banquo's ghost, in place and out of place, it was ever turning up, until at last the patience of a large number was completely exhausted by it. This did not arise from any want of interest in the matter (for many who felt this way had, like myself, subscribed the year before to the "DENTAL PROTECTIVE UNION"), but plainly and simply because it was out of place, and interfering with the legitimate objects of the organization. Eventually, when the committee made a report of the terms agreed upon, it was on the last day of the session, and within a quarter of an hour of the final adjournment of the Association, when very few of the members were present (not more than twenty-five in all), and there was no time for discussing the various points; under these circumstances the report was hastily, although not unanimously, adopted.

This action, however, on the part of the Association is by no means to be regarded as binding upon the profession at large, or those members of the Association who were absent, or, being present, opposed it.

Again, it is well to remember that, although a representative body, the American Dental Association has no right, and by no means aims to exercise any legislative or governmental influence over the profession, but rather desires to *recommend* or *suggest* anything that may emanate from it to the profession. It is trusted that this fact will be remembered, and that the experience gained in this matter will serve to guard against similar complications in the future.

The use that has been made of the agreement, by the Vulcanite Company, indicates that a committee of professional men is no match for a thoroughly organized Company composed of experienced, shrewd, and sharp business men.

In conclusion, a part of the plan which the Company demands for the settlement of accounts with those who take out licenses must be repugnant to those members of the profession who respect the claims which their patients have upon them, so far as privacy is concerned. Every lady or gentleman who may be so unfortunate as to require a set of teeth, does not desire to have that fact published to the world; and yet the Company requires that each operation made shall be entered in a book (furnished for the purpose), along with the name of the party and the place of residence, this book to be accessible to the agent of the Company at such times as he may desire to look over it. The violation of confidence and privacy such a course implies, would be most inexcusable and reprehensible.

As this matter is in litigation with the Vulcanite Company on one side and the dental profession on the other, every member of the profession, whether engaged in mechanical dentistry or not, should feel that the interests of the profession are his interests, and therefore support it by contributing to the fund which is being raised to test this matter in the courts. Those who have or may feel inclined to settle with the Company at present, should know that by doing so they are giving to the Company one of the most important sinews of war—money; and thus enabling it the more effectively to carry on the suit against the profession. Those who have not settled, should think twice before they take such a step.

J. H. M'Q.

ASSOCIATION OF THE COLLEGES OF DENTISTRY.

During the session of the American Dental Association held at Boston, a private conference took place between the members of the faculties of the dental colleges present, at which the propriety of some united action on the part of the different institutions for the advancement of education was discussed, and the subject referred for future action to the colleges. As a consequence of this, a conference was held in Philadelphia, October 17th, 1866, at which all the dental colleges in the United States were represented, as follows: Baltimore College of Dental Surgery, Prof. Gorgas; Ohio College of Dental Surgery, Prof. Taft; Pennsylvania College of Dental Surgery, Profs. Buckingham, Wildman, Barker, Forbes, and Truman; Philadelphia Dental College, Profs. Kingsbury, Wardle, McQuillen, Flagg, Leeds, and Garretson; New York College of Dentistry, Profs. Parmly, Dwinelle, and Kingsley.

The session, which continued throughout the entire day and closed at

quite a late hour in the night, was characterized by the most perfect harmony and good feeling during the discussion of the various points which were brought forward; and resulted in the formation of an association with the above name, having as its primary object the establishment and maintenance of a uniformity of action on the part of all the institutions relative to the length of pupilage which shall be demanded of dental students, the requirements of candidates for graduation, etc.

The curriculum of instruction in the dental colleges was considered, but no effort was made to control that matter, each institution being left free to adopt the course most in accordance with the convictions of the respective faculties.

Limited space prevents the presentation of a full report of the proceedings, but the main points agreed upon were as follows:

1. Two years of private tuition, inclusive of two full courses of lectures in a dental college, in addition to an examination upon the part of a faculty, shall be required of those who propose to graduate as Doctors of Dental Surgery.

2. A graduate of a respectable medical college, by studying one year under a reputable practitioner of dentistry, shall be eligible to come forward as a candidate for graduation by attending one full course of lectures in a dental college.

3. Those who have been engaged in the practice of dentistry for seven years, shall submit to a preliminary examination before entering a dental college; and if the examination proves satisfactory to the faculty, that period of practice shall be regarded as equivalent to one course of lectures.

It was decided that all of these points should take effect at the opening of the collegiate session of 1866–67.

The officers for the ensuing year are:

PRESIDENT.—Eleazar Parmly, New York.

VICE-PRESIDENT.—F. J. S. Gorgas, Baltimore.

RECORDING SECRETARY.—J. Taft, Cincinnati.

CORRESPONDING SECRETARY.—J. H. McQuillen, Philadelphia.

TREASURER.—George T. Barker, Philadelphia.

The next meeting of the Association will be held in Philadelphia, on the third Monday in March, 1867. J. H. M'Q.

SHARPENING THE POINTS OF PLUGGERS.

THE finely serrated pluggers, which have entirely superseded the large and blunt-pointed instruments which were generally employed by the profession, only a few years back, are liable, by continuous use, to become of as little value for the thorough consolidation of foil or sponge gold as their antiquated predecessors. In other words, although made of the best

material, serrated with the greatest care, and tempered in the most skillful manner, they become blunted by use, the points broken off, or the serrations clogged with gold. It is not an unusual thing for inexperienced or indifferent operators to continue to use them in this condition; but careful and skillful operators, who recognize how much the perfection and permanence of operations depend upon good instruments, either have them repointed and retempered by the instrument-maker, or throw them aside and purchase new ones in their place. The frequent softening of steel by heat is objectionable, however, on account of the liability of burning out the carbon, and reducing what was originally a fine specimen of Stubb's steel to the best quality of wrought-iron, and thus rendering it practically worthless for the purposes required.

To meet this contingence, I have been using for some time past a thin slab of Lake Superior stone, which I sharpen to a knife-edge on the lathe with a corundum wheel. When the serrations become clogged with gold, or the points blunted, by running this between the points, they can be readily sharpened, the gold removed, and the instrument rendered as useful as when it first came from the hands of the instrument-maker. This stone-knife, as it may be called, is not only valuable in resharpening instruments, but also in their original construction, by removing the rough and ragged edges left by the file, which annoy operators so much, by dragging the gold out of the cavity, on account of the foil or sponge adhering to the end of the instrument. J. H. M'Q.

PUBLISHER'S NOTICE.

WE have added several pages to this number, in order to present to the profession throughout the country the recent arguments before the United States Circuit Court of New York, on the motion for preliminary injunctions against Dr. Thos. G. Wait for infringements of the Goodyear patents; also the opinion of Geo. Ticknor Curtis, Esq., addressed to the American Dental Protective Society of New York, and the address of the Society to the profession; the action of the Ohio State, Central Ohio, and Northern Ohio Dental Associations, and the proceedings of the dentists of Philadelphia in reference to the demands of parties claiming the right to control the use of vulcanite or hard rubber, so far as the same is applicable to dental purposes; to which is added a copy of the record required to be kept by those who assent to the claims of the Goodyear Dental Vulcanite Company.

The settlement of these questions, affecting as it will the interests of nearly every member of the profession in this country, has seemed to us of so much importance that we have issued an edition sufficiently large to place a copy thereof in the hands of every practicing dentist whose address we have been able to procure. SAMUEL S. WHITE.

OPINIONS, ARGUMENTS, AND PROCEEDINGS IN REFERENCE TO THE CLAIMS OF THE DENTAL VULCANITE COMPANY.

American Dental Protective Society.

In consequence of suits recently commenced in the City of New York, and other places, for the alleged infringement of patents held by the Dental Vulcanite Company of Boston, for the use of rubber, as applied to dentistry, the dentists of New York have organized, under the name of the American Dental Protective Society, to defend the profession from what are believed to be the unjust demands of said company; and in this effort they desire the co-operation of all dentists throughout the country.

The expense of contesting these patents, if appealed to the Supreme Court of the United States, will be large; involving a possible outlay of $15,000 to $20,000. To raise this amount, liberal subscriptions should be made by every member of the profession, and remitted immediately to the Treasurer of our Society, Dr. F. H. Clark, No. 28 *University Place, New York*, one of our oldest and most reliable dentists, who will acknowledge the receipt thereof. Subscriptions in this city include all amounts from $10 to $500.

Incentives to action are found in the fact that submission to the demands of the Dental Vulcanite Company, at this time, may supply it with the means of fastening its monopoly upon the profession for a period of seventeen years, with the power of indefinitely increasing the amount of its tariff as soon as the present short-term licenses shall have expired. This power the agent of the company has boldly asserted.

The statement made in circulars of the Dental Vulcanite Company that the American Dental Association, at its recent session in Boston, was a party to the enforcement of these claims is unfounded in truth; the Association never having indorsed the demands of the company, and being utterly devoid of power to interfere in any such matter. Whatever may have been the wishes of a small number of the members of that body, the great majority signified by their votes their determination to oppose this iniquity in all the courts of the United States. This design the American Dental Protective Society will put into execution as far as in its power; and now warns the dental profession that the apparently easy terms of settlement, proffered by the company at the present time, are designed to catch and hold them beyond redress for future and more oppressive demands; and advises all contributors to its funds not to compromise with, or pay the Dental Vulcanite Company any royalty.

Threats of injunctions and summary proceedings have induced some to take licenses, but we are of the opinion that the United States Courts will take no hasty action; but that the company must wait and abide the issue of a fair and impartial trial.

In the United States Circuit Court, sitting in this city, Mr. Justice Nelson presiding, application was made, November 19, on the part of the company for preliminary injunction, which was refused by the Court, and the case postponed, for a final hearing on its merits, to the next term. This suit is brought under the Cummings and Goodyear patents; a previous suit under the Cummings patent alone having been withdrawn.

The Society have retained Messrs. George Ticknor Curtis and Stephen D. Law, of this city, to defend its members. The opinion of the senior counsel on the validity of the claim of the company is annexed. Meetings of the Society are for the present held regularly every Monday evening, at Room 18, Cooper Institute, New York; dentists visiting the city are invited to attend. It is desirable that this address should be circulated as widely as possible, and that attention should be called to its statements in the public prints wherever it may come: these duties are urged upon every dentist who may read it.

Brethren of the dental profession throughout the United States! the cause that we have undertaken is that of a great profession against a great monopoly. We appeal to you, to yield your vigorous and untiring support to our efforts; and, in return, this Society pledges itself to you, to leave nothing undone toward the overthrow of these illegal claims, and to secure to the dental profession, for all time, the free use of all vulcanizable compounds.

All communications should be addressed to the Secretary of the Society.

OFFICERS.

President.—John G. Ambler.

Vice-President.—W. B. Roberts.

Treasurer.—F. H. Clark, No. 28 University Place.

Secretary.—W. C. Horne, No. 104 West 26th Street.

New York, November 20th, 1866.

Opinion of Geo. Ticknor Curtis, Esq.

Dr. T. G. Wait, *Chairman of Executive Committee of the American Dental Protective Society, New York.*

New York, Nov. 4, 1866.

Dear Sir,—I have carefully examined the reissued letters patent granted to the "Dental Vulcanite Company," January 10, 1865, for an invention purporting to have been made by John A. Cummings, and am of opinion:

First. That the subject-matter described and claimed in the specification is not a patentable invention, assuming it to have been first practiced by said Cummings. It is, on its face, a patent for making dental plates of vulcanized rubber, or hard rubber, or "vulcanite;" in lieu of gold, silver, platina, or other metal. In other words, it is a patent for making

a thing of one substance, which substance the patentee does not claim to have invented, in the place of other substances of which that thing has long previously been made. Mere change of material in making a well-known thing, although the new material may be attended with some comparative advantages, will not support a patent. This patent covers nothing more than such a change of material, and, in my opinion, is void.

Second. That this patent is void, by reason of the following facts: The original application of Cummings, for a patent, on this alleged invention, was made April 12, 1855; was rejected by the Commissioner, February 5, 1856, and no appeal was taken from that rejection. Eight years afterward, to wit, March 25, 1864, Cummings made a new application, and thereupon the original patent, now reissued, was granted. I have carefully examined the ruling recently made in Boston, by Mr. Justice Clifford, and find that he held this patent to be good, on the ground of a technical continuity of the first application by reason of the second, which the learned judge treated as having been filed in aid of the first; and that, therefore, there was no legal abandonment of his invention by Cummings, notwithstanding the interval of eight years, during which time there was no proceedings in the Patent Office, after a rejection. I am of opinion, that none of the previous decisions of the Supreme Court of the United States warrant this ruling, and I do not think it will be sustained by that court, if carried before it.

Third. That from the facts which have been laid before me by you and other dentists, Cummings, even if he was the first person to use "vulcanite" in making dental plates, actually abandoned his alleged invention to public use. In the case before his honor, Judge Clifford, which was a final hearing in equity, all that the learned judge said on this subject is comprised in this statement: "Actual abandonment is not *satisfactorily proved.*" In any new proceeding in equity, the evidence on this point, if conflicting, may result in an issue to a jury, or it may be passed upon by the court. I am of opinion, that the result of the finding on this point, in the case heard before Judge Clifford, is not of sufficient weight to deter any one from raising the same question upon the facts which have been submitted to me.

Fourth. That from the facts which are well known to exist, respecting the long public use of this alleged invention by the members of your profession in this city and elsewhere, the Federal Courts, sitting in equity, ought not to grant, and upon the principles of equity jurisprudence as administered in patent cases, will not grant injunctions before a final hearing. If such injunctions are granted, of course they must be submitted to, and the cases must be prepared for a full and final hearing on the merits.

Having understood from you, that an association has been formed in

this city among the dentists, for the purpose of protecting themselves and each other against the claims advanced by the proprietor or proprietors of this patent, and having accepted a retainer for this purpose, I deem it proper to add that, in my opinion, the case is clearly one that ought to be carried to final adjudication in the Supreme Court of the United States; and that not only your own profession, but the kindred professions of medicine and surgery, will render you their moral support in subjecting it to such adjudication.

I have not thought it necessary to cover in this opinion any but the most prominent grounds of objection to this patent. There are others, which appear to me equally fatal to its validity.

I am informed that suits in equity have been commenced against you, and other dentists, in aid of this claim of the Cummings patent, upon the hard rubber patent of the late Nelson Goodyear, in the name of his administrator. One of these bills in equity—that against yourself—I have examined. It sets forth no adjudication in which the Nelson Goodyear patent has been sustained, against what I believe to be a formidable objection to its validity.

Without going at large into the various defenses, which may be made to the claims, now sought to be enforced against the dentist, by the proprietors of the Goodyear hard rubber patent, I am prepared to express my opinion, as follows:

First. That the substance called hard rubber is, according to the specification and claim of the reissued Nelson Goodyear patent, produced by a variation in the rule of working originally discovered and patented by Charles Goodyear; and that it is therefore extremely doubtful whether, either in respect to process or product, the making of hard rubber could be the subject of an independent patent. I do not understand that this question has ever been passed upon by any Circuit Court of the United States, and it is certain that it has not been acted on by the Supreme Court of the United States.

Second. That assuming the Goodyear hard rubber patent to be in all respects valid, I am informed that it is capable of proof, that the use of hard rubber, in dentistry, in this city, has been notoriously public and free, for a period of eleven years; with the acquiescence of the proprietors of the patent. I am, therefore, of opinion that, as to the use of hard rubber, or of the process of making it in the art of dentistry, there has been a dedication of it to public use.

Third. That, even if the proof should fall short of establishing a dedication to public use, there has been such an acquiescence that no Court of Equity would be warranted in enjoining its use before a final hearing.

I am, very respectfully,

Your obedient servant,

GEO. TICKNOR CURTIS.

Proceedings of Dental Associations.

At special meeting of the Northern Ohio Dental Association, held at Cleveland, October 11, 1866, it was

Resolved, That the Northern Ohio Dental Association ignore the claims of the "Goodyear Dental Vulcanite Company," as set forth in their circular recently issued to the profession. Believing it to be an extortion, we will render to any and all dental societies and associations our cordial co-operation in any endeavor they may undertake to defend themselves, or any member thereof, against the enforcement of this extortionate demand.

Resolved, That the secretary be requested to send copies of the above resolution to other societies and associations.

B. F. Robinson, *President N. O. D. A.*

W. P. Horton, *Secretary.*

At a meeting of the Ohio State Dental Association, held at Columbus, November 1st, it was resolved that the dentists of Ohio refuse to accede to the demands of the Goodyear Dental Vulcanite Company of Boston.

At a meeting of the Central Ohio Dental Association, held at Zanesville, November 13th, it was resolved to indorse the doings of the State association, and each dentist present at each association gave one hundred dollars, and some gave one hundred and ten dollars, to assist those who might be prosecuted.

Circular of Committee appointed by Philadelphia Dentists.

At a meeting of dentists and others interested, held in Philadelphia, on Tuesday evening, November 27th, the undersigned were appointed a committee to solicit contributions to a fund, to be created for the purpose of testing by law the equity of the claims now being made by parties holding patents by which they assume to control the use of hard rubber or vulcanite, so far as the same is applicable to dental purposes.

Believing that these claims are neither just nor legal, we propose in protecting the rights of the dental profession to employ able counsel, and an expert, if necessary to collect testimony and make a more thorough investigation and defense than isolated individuals defending for themselves can afford.

The committee have full power to collect funds and employ counsel according to their best judgment, but are not expected to take any action in the matter until a sufficient amount of money to meet the necessary expenses shall be deposited in their hands.

When, by reason of success or failure, we shall decide that further ac-

tion is unnecessary, the amount, if any, remaining in our hands shall be distributed to the contributors, *pro rata*, accompanied by a report of the disposition made of the funds.

Contributions will be received by either of the committee:

DR. JAMES TRUMAN, " LOUIS JACK, " C. A. KINGSBURY, " ISAIAH LUKENS, W. A. DUFF, JOHN R. RUBENCAME, SAMUEL S. WHITE,	*Committee.*

COPY OF THE BLANK FURNISHED TO LICENSEES.

To General Agent Goodyear Dental Vulcanite Company, Boston, Mass.

The following is the record of all the plates, and parts of plates, for artificial teeth, in which rubber or any allied gum has been used, which I have made, furnished, or sold, either directly by myself or by any person or persons in my employ, since the .... day of .... 186...; together with a description of such plates and parts of plates, and the names and residences of the persons to whom furnished, and the dates when furnished. And I certify upon honor that this record fully represents all my work in which rubber or any allied gum has been used, in any way, for all the time named, and that it is in all respects true.

DATE.	NAME.	RESIDENCE.	DESCRIPTION. Whether upper or lower set; full or partial plate; and, if partial, how many teeth.

INFRINGEMENT OF GOODYEAR'S PATENT.

UNITED STATES CIRCUIT COURT.—Before Judge Nelson. Josiah Bacon *vs.* Thomas G. Wait. Henry B. Goodyear et al. *vs.* the same.

This case came up on Monday on a motion for preliminary injunctions against the defendant, and the following proceedings were thereupon had:

NEW YORK, November 19.

Charles F. Blake, Esq.—I desire to bring to your honor's attention, this morning, some motions for injunctions against Thomas G. Wait, for infringements of the Goodyear patents, and of a patent for an improvement in dental plates.

The first case to which I ask your honor's attention is the case of Goodyear against Wait, a suit brought upon the familiar reissued hard rubber patents with which your honor is so well acquainted that it is unnecessary for me to read them to you, or to do more than to read the affidavits to prove the infringement.

George Ticknor Curtis, Esq.—I appear for the defendant in this case; and have important grounds to lay before your honor why we should not be pressed to a hearing in this motion to-day. I suppose that now is the proper time for me to interpose and submit those reasons to the court. I understand that the case now immediately presented to your honor is an application for an injunction, founded on the Goodyear hard rubber patents, against Thomas G. Wait, a dentist in this city, who is charged in the bill with making use of hard rubber in the manufacture of what are called dental plates, in which artificial teeth are inserted. It is mentioned also by the counsel who has just addressed the court, that there are a series of other cases on another patent issued to one Cummings. Whether it is the design to bring those on simultaneously with the application under the Goodyear patent, or whether it is the intention to have a hearing in the Goodyear case first, and have that closed, and then bring forward the Cummings patent, is not yet stated. But what is now before the court is a motion for an injunction, founded on the hard rubber patent of Nelson Goodyear. Now, the notice of this injunction was served on us last Wednesday. The defendant is a practicing dentist in this city, of considerable reputation and a large practice. He belongs to a body of professional men whose duties all day long, while there is daylight, are concerned with the relief of the suffering, the aged, and the infirm, and he is one of a profession all of the members of which are attacked under these motions, and under circumstances that will presently appear from the affidavit which I am about to submit to the court, for the use of this substance called hard rubber, in this particular application, which they have used for a long period of years unquestioned and undisturbed.

I ought to explain, before reading this affidavit, because it has relation to both suits, that the so-called Cummings patent is a patent for the application of hard rubber to dentistry, and it covers the substitution of the material of hard rubber for gold, silver, or platina, in the manufacture of the well-known article, dental plates; a patent which stands simply and nakedly on the substitution of one material for another. And now, put forward in advance, and in aid of that, an application is made for an injunction under the hard rubber patent. Cummings himself not claiming or pretending to be the inventor of hard rubber, but only the inventor of the substitution of that material in the place of gold, silver, and platina, which had been previously used. Now, the affidavit which I am about to submit to your honor relates to the merits, in some degree, of both these applications, but not to the trial of the merits; it relates entirely to the question of whether reasonable and suitable notice has been given to the members of this profession; for this particular defendant selected in this matter is but the representative of a class, and I am authorized to say that I stand here to-day the representative at the bar of this court of a very large association of the profession who are organized with the express purpose of defending themselves and each other against those suits. The question, therefore, which I have the honor to submit to the court is, whether, under the circumstances, reasonable and suitable opportunity has been given to the gentlemen of this profession to meet this motion, the notice in this particular case having been served on Wednesday last. It is also true, and I ought frankly to state it, in order to bring before the court all the circumstances which should affect its discretion in now requiring us to proceed; it is also true that under the Cummings patent a notice of an injunction was served upon us, returnable a week ago last Saturday. Subsequently, that was discontinued or withdrawn, and then a fresh notice was served upon us on Wednesday last, in regard to both these patents, returnable this morning.

Mr. Curtis then read the affidavit of Thomas G. Wait, the defendant, and continued as follows:

May it please your honor: Assuming now the entire legal validity of the hard rubber patent, and I am aware that I stand before a court which has had occasion, in some of its aspects, to pass upon that question, although it is not to be assumed, under any circumstances, that all defenses to the validity of that patent have been exhausted, that this court has had occasion to pass upon them all; but I am aware that I stand now before a judge who has had occasion to investigate the question of the validity of that patent in some of its aspects, and who has upheld it, and occasionally, also, from time to time, been in the habit of granting preliminary injunctions against parties who have been in the use, the unlicensed use of that manufacture or material. But here is a case where, if the facts sworn to in the affidavit can be brought before this court, they show unquestionably a dedication *ad hoc*—a dedication of this material to this particular use, which it is sought to

enjoin this defendant from continuing. Now, I submit with great confidence to the court—standing here to represent a profession which appeals to this court for relief against this summary, and, as I might well characterize it, this violent course of proceeding—that the notice of motion for an injunction against those gentlemen, who have been in the use of this material for eleven years, under the very face and eyes of the proprietors of this patent, is altogether too short. If the facts, which are sworn in this affidavit are true, and are brought before this court in a proper manner, and so as to convince the court of their truth, then there arises a question which may very well stay an application for an injunction as against the most valid patent in the world. I therefore ask your honor for a special order granting suitable time for those gentlemen, situated as they are, to prepare to meet this case. I add, also, that when the notice of motion was served, on Wednesday, I was out of the city, or, rather, I left the city on Thursday morning, not knowing that this notice had been served. I was necessarily absent. The solicitor who served it knew that I was to be absent, and knew that I was the senior counsel relied upon for the defense of these cases. And it is also a fact which I ought to state to the court, that I have had no intercourse, and necessarily no opportunity for intercourse with any of these gentlemen, excepting in the evening, or at early hours in the morning, when most people are not accustomed to do business.

Mr. Blake.—I suppose, if your honor pleases, that the only question at present before the court is, whether any further delay shall be given to the hearing of this notice. Now, we have brought ourselves within the rule, in the terms of our notice, and, as I suppose, the notice entitles us to a hearing now. But, in regard to the facts which my learned friend suggests, of a want of opportunity, it is only fair that I should call your honor's attention to the fact that this organization of dentists, which he says he represents, was notified of these proceedings as early as the 25th day of September.

Mr. Curtis.—My dear sir, they did not exist at that time as an association.

Mr. Blake.—The first bill filed in New York in this matter was on the 25th day of September. The bill in this case was filed on the 25th day of October; and my friend on the other side will bear me witness, that so soon as it could be done, he was furnished with all the papers in our possession bearing upon any question that could come up in this controversy; so that while he is talking of having had only four days' notice, he has actually had nearly a month. And he has been in conference with me upon those points in regard to which I could furnish him evidence, so that we are far within the equity of the rule when we come before the court, and insist upon our right of being heard on the usual notice provided by the rule. There are four cases here, it is true; but we are now proceeding in the case of the hard rubber patents against Wait. That is a patent which has been before your honor, and thoroughly tested; and your honor is in the habit of granting preliminary injunctions under it; and whatever may be the nature of the defense in regard to the Cummings patent, I am unable to see any reason why, upon the other patent under which we are entitled, we may not be heard and have our rights determined. As to what was stated in the affidavit concerning the merits of this controversy, I do not, at this moment, propose to enter into a discussion. I shall proceed, with your honor's leave, to read the affidavits upon which the motion is based upon the Goodyear patent.

The Court.—We must dispose of the preliminary question first.

Charles M. Keller, Esq., for the plaintiffs.—If your honor will permit me, I will add only a few words to what my learned associate has stated. The only question, I suppose, upon the motion under the Goodyear patent, is one of infringement; the validity of the patent itself having been thoroughly tested in this court on a final hearing. Your honor can remember how thoroughly and fully it was discussed in the case which was argued before your honor at Windsor, in 1862. Now, the only question on which they were required to make preparation—the only question, I presume, that is open here, is the one of infringement. If they did not use vulcanized hard compound rubber in making these plates—or if, using that material, they did it under license, under authority from the owners of the patent, it seems to me that four days, or even two days, affords abundant opportunity to present that defense. As to the Cummings patent, it is one which has been tried lately on a final hearing, and sustained before his honor Mr Justice Clifford, and I suppose that by the rule of comity the only question open on this motion is one of infringement. Now, a few days is abundant for that. We have an affidavit here sworn to by the parties who witnessed this making by the defendants. If that be not the

hard compound India rubber—if it has not been moulded and the teeth fastened on it according to the process described in the Cummings patent, they had abundant time to make the preparation to meet these motions. I would incidentally remark that dentists have been enjoined under the Goodyear patent, for violation of it, in making these plates, since the decree of this court on the final hearing at Windsor. I do not propose to go any further into the matter.

Mr. Curtis.—In regard to the service of papers on us, or any notice, anything that could be, or ought to be in ordinary diligence, regarded by counsel as ground to expect a proceeding, I have to state that the only papers that were ever served upon us prior to the technical service in this case were those under the Cummings patent, and they do not touch the questions I have stated to the court under the Goodyear patent. Under the Goodyear patent no papers were ever put into my hands specially. Undoubtedly there is a general rule of this court that four days' notice is sufficient. *Prima facie* it is presumed to be so in ordinary cases, but this is not an ordinary case.

The Court.—I have no question about the propriety, in the case presented, of giving you longer time to meet the bill, both as respects the hard rubber patent and the Cummings patent, the latter being a patent which I know nothing about and have never seen. The only doubt in my mind—the only question which I was pausing about—was whether, after the great delay in instituting this suit on behalf of the hard rubber patent against this application of it by the dentists, I really ought to interfere by this summary process of injunction. It seems, from the statement, that they have been in the use of it some eleven years; and although I agree that that is no defense to a patent, yet it is a reason very often assigned why a court will not, under circumstances where so long a use has been acquiesced in by the patentee, tie up business by this summary proceeding of injunction, but rather leave the party to go to his proofs and dispose of the case on its merits. That is the only doubt I have now about it.

Mr. Keller.—If your honor will indulge me for a moment, the decree sustaining this Goodyear patent was not made until 1862, and soon after that injunctions were granted against dentists by this court. Immediately after obtaining some of these injunctions, the title to this special use of the hard rubber passed from the previous owners, who were the plaintiffs before your honor, into other parties, and then commenced this litigation in Boston under the Cummings patent; and pending that, the owners did not feel disposed to proceed with the motions for injunctions. Prior to 1862, prior to your honor's decree sustaining this patent, there had been no tests on its validity, and if your honor will recall to mind the statement in the affidavit which has been read, for a long time these dentists were in the habit of using this material by permission of the owners of the Goodyear patent, by purchasing the material prepared for them, paying the owners of the patent for its use; and so long as they paid tribute to the patent by purchasing the compound from the owners of the patent, they had permission to give it this special application.

The Court.—Do you mean the hard rubber?

Mr. Keller.—Yes, sir. This was said in this affidavit. But after the decree of this court sustaining the Goodyear patent, the title to the use of this for dental purposes passed into other hands, and those parties acquired no right to use it except so far as they purchased the prepared rubber from the American Hard Rubber Company; that company having parted with its right to the present patent, could confer on those parties no further right beyond the use of the special material which they purchased from the owners of the patent; so that there has never been any acquiescence on the part of the owners of the patent in this particular use of the material since the patent was sustained.

Mr. Curtis.—I don't believe the judge now on the bench can recollect enjoining dentists from the use of hard rubber.

The Court.—I do not think the case has been before me.

Mr. Curtis.—I am free to admit that there does arise a question as to whether the purchase of the materials from the agents of the company, to be hardened in the laboratory of the dentists, is covered by the Goodyear patent if they make it by that process at all, which I do not mean to admit.

The Court.—I did not understand, in your statement, whether the purchase was made from the patentee of the vulcanized rubber patent, or from the patentee of the other rubber patent.

Mr. Curtis.—I understand the facts to be these, may it please the court: For a

long series of years in this city, many of the dentists have been in the habit of applying to the stores of the licensees and agencies of the hard rubber patent for the purchase of materials sold for dentists' use; that they take them home and harden them in their own laboratories as they have occasion to use them; and they do it—I am not prepared now to admit, and do not admit, either on this motion or at any future time, that they do it—by the same process that is covered by the patent of Nelson Goodyear. But we will admit, for the purpose of this preliminary discussion, that they do harden it by the same process that is covered by the patent of Nelson Goodyear. Then there arises the question how far that is an acquiescence, on the part of the owners of the patent, in the right of the parties to use it to whom they sold these materials. I also understand that for a long series of years these materials have been sold by the class of dealers who keep large establishments for the sale of what are called dentists' materials, covering this as well as other things, sold openly in the shops, and purchased by the dentists, and taken home to use as they had occasion for them; and that use is also covered by this patent, as it is claimed. Now, I had almost said it is immaterial to us whether we are called upon to meet the motion for a preliminary injunction, or the question that may arise on a final hearing. A final hearing in this controversy there inevitably will be, because the only effect of an injunction on the profession must be to discontinue the use of this material until a final hearing. The demands that are made for submission and licenses are altogether such as these gentlemen deem it their duty to themselves, and to the public, not to comply with. The only question therefore is, practically, whether this controversy shall come on under a motion for a preliminary injunction, or at a final hearing. If it is to come on under a motion for a preliminary injunction, then we want a suitable time to meet it.

The Court.—My advice to the counsel on both sides, especially to those on the part of the patentees, is to go to a final hearing. It will hardly facilitate the proceedings to go into an elaborate hearing upon affidavits, which is a very unsatisfactory mode of disposing of a case of this character; and under the pressure of business, even this motion for an injunction cannot be taken up much earlier than the case on the final hearing. You can have it all ready at the commencement of the next term. It is a litigation that touches very extensive interests. I have had something to do with dentists in my family, and my own dentist has told me in conversation that the hard rubber was almost universally used as a substitute for gold and silver plate; that it was much cheaper, and in many respects superior, and that it was coming into universal use. And I think, therefore, under the circumstances, that rather than trouble the court with litigation upon affidavits upon both sides, and which would not either promote the justice of the case, or, in my judgment, facilitate the hearing—that you had better, for the interests of all parties, go to a final hearing, and then the question will be definitely disposed of. I am inclined to give it that direction.

Mr. Keller.—If your honor please, it would be putting the parties, from my personal experience in the matter, to an enormous expense—eighteen months, at least, of hard labor, such as I passed through in the cause that was tried on final hearing before your honor, in obtaining the evidence, going to various parts of the United States, and the length of argument. My opening, I think, occupied about fourteen hours.

The Court.—You don't comprehend me at all. I don't mean rehearing of the question on the part of the hard rubber patent; that I regard as settled. It is the use of it for this particular purpose.

Mr. Keller.—There was one patent for the material, the vulcanite, and another patent for the process of its preparation.

The Court.—I don't go into these patents; they are well settled; I don't expect to meet them, of course. I do not rehear those cases that I have decided.

Mr. Keller.—If your honor please, look at it in this light. They use the vulcanizing process in making those plates; the vulcanized India-rubber; they prepare it according to the patent. That of course is an open question at all times, whether they do or not. But doing that they are charged here with infringing three patents, two patents to Goodyear, one for the vulcanite, and the other for the process of vulcanizing, and the third to Cummings for the special method of making these plates out of this material. Now they cannot infringe the Cummings patent without an infringement of the Goodyear patents, and whether you enjoin under all three, or under the Goodyear patents alone, certainly does not give any benefit to the dentists. If they use the vulcanite, it is no relief to them to throw open the Cummings

patent, because that only relieves them from the claim for damages under the Cummings patent, but leaves them open to injunction, providing they are using this material under the Goodyear patents.

The Court.—I don't comprehend why it burdens or increases the labor of the hearing to go to the final hearing, and refusing to hear this motion on the injunction; because the decision of the motion in the injunction does not influence the final hearing, it only superadds the hearing on the motion to the labor of the final hearing; therefore I do not see your argument that this throws the burden upon them of a final hearing; I do not mean by declining to hear this motion that I am going to rehear these patents. I have spent time enough on these. These questions are settled. It is the open question in relation to this application of the article by the dentists, and that only, that is involved.

Mr. Keller.—Your honor will remember that many injunctions have been granted by you and your associate judges against manufacturers of combs who did not vulcanize the India-rubber, but bought the rubber and cut it up into combs without authority. Now these dentists, by vulcanizing rubber in making the plates, have infringed this patent just as much as the comb-makers; and if they be enjoined from vulcanizing and using the materials, they might as well be enjoined under the Cummings patent also, because it is only a patent for the process of inserting the teeth and moulding the plates; but, in doing this, they must necessarily infringe the Goodyear patent.

The Court.—That is, Cummings, I suppose, originated the idea of this new application of the article; and it is dependent upon the right to use the previous Goodyear patent: there is no doubt of that; but I don't see that that alters the case at all. Now, an injunction in this case, whenever it is issued, is not confined to this suit; it is not confined to any district of the country, it is universal, because this profession extends to every county in the Union, and they have been using it for a long time. I don't say that their using it for so many years removes their responsibility at all; but then it deeply affects extensive interests, and I am not disposed to be precipitate where such is the case; on the contrary, I am rather inclined not to act upon it until the question is finally decided, and when an injunction would be an end of the case.

Mr. Keller.—In the other circuits, in different parts of the country, six hundred licenses have been granted to dentists.

The Court.—They are granting them every day. My dentist has a license; I think he told me he paid $125 for it.

Mr. Keller.—This is not the case where a patentee is refractory and endeavoring to prevent the use of it. The only question is whether the profession shall be permitted openly to infringe a valid patent which has been sustained on final hearing, and universally submitted to by all the trades that use this material. The individuals who make these pencils, like the one I hold in my hand, have licenses under the Goodyear patent, although they have patents of their own for their special mode of making the pencils. And so it is with surgical instruments of various kinds. They all pay tribute to the Goodyear patent, and the patentees are always willing to grant licenses on liberal terms. But here is, in the City of New York, a profession arraying themselves against this patent, after it has been sustained on final hearing in this court, and enforced against every trade that uses this material. There is the sole question.

Stephen D. Law, Esq., for defendant.—Let me make one remark. May it please your honor, it has been illustrated and argued in respect to the manufacture of these pencils and combs, that inasmuch as the patentees have endeavored to stop infringements in those branches, therefore the court is compelled to issue injunctions on this. It seems to me that the very fact that the patentees have endeavored to prevent its use for combs and pencils without a license, and have left it to the dentists, making no effort—or next to none—to prevent it, is a good reason for denying this motion. So far as the dentists are concerned, they have been permitted to use the hard rubber; it has been prepared expressly for them, and put in the market by the owners of the patent, and they never have, until now, endeavored to stop it. And this combination of the profession is not a combination arrayed against the patent; they only claim that they have a right to use it. If that combination exists, it grows up from the fact that these men have not done by them as they did in the case of the manufacture of pencils and combs, but allowed them to go on and use it without their prohibition.

Mr. Keller.—When this right belonged to the Hard Rubber Company, every in-

dividual dentist in this city who attempted to make dental plates of this material without purchasing it from the Hard Rubber Company, or from their agents, if it was known, had bills filed against them, and injunctions were issued against them. But, as I said before, the title passed out of the American Hard Rubber Company with other parties, and the litigation then sprung up; and in Massachusetts they tested the validity of the Cummings patent; and during the pendency of that controversy no steps were taken to enforce that patent. But the moment a decision was had, and a decree obtained sustaining that patent, steps were taken at once, and dentists were notified all through the country, and injunctions granted against those who refused to take licenses.

The Court.—I am inclined to give it the direction I suggested, that it had better go to a final hearing. Let us dispose of the question finally. It touches too many interests for summary disposition.

Mr. Keller.—What questions will be considered as open on the final hearing?

The Court.—I don't mean the validity of the hard rubber or vulcanite patent; merely the right of the defendants to use these patents.

Causten Broune, Esq. (of Boston).—I am here specially to represent the owners of the Cummings patent. Do I understand your honor that the questions which will be reserved for a final hearing will not touch the validity of the Cummings patent, or the validity of the Goodyear patent for hard rubber?

The Court.—I do not know anything about the Cummings patent. If it has been tested in the First Circuit and sustained, of course that will have great weight with me. I cannot say anything about it, for I never saw it. But the other two patents I have decided upon, and, of course, I am not going to look at them again.

Mr. Broune.—Then I am to understand, and may inform my clients in Boston, that, on the final hearing of these cases, the question of the validity of the patents for the hard rubber and the process of making hard rubber will be understood by the court to be settled?

The Court.—Yes.

Mr. Broune.—Then as regards the Cummings patent, which stands upon the adaptation of this material to the manufacture of dental plates, your honor leaves open all the questions that may arise?

The Court.—That depends upon its merits, and decisions in other Circuits may be used and are entitled to great weight.

Mr. Curtis.—I should like to make a remark here, in order that I may not, by my silence, be concluded, or misunderstood by the court or by my opponents. It is not very likely that Mr. Law and myself would bring before the court for re-examination, questions in regard to the validity of the Goodyear patent which have been passed upon by this court. We do not, however, desire your honor to say, we pray your honor not to say, that, if there should arise an objection in regard to those patents which has never been before this court, we are not to put it into our answer and be heard upon it. Your honor, I take it, does not mean that. Your honor means that the court is not disposed to go into questions that have been examined and settled.

The Court.—That is it.

The motion was then understood to be dropped.

We append the brief report of the *New York Tribune*.—Pub.

DENTAL PATENT COMPANY—IMPORTANT TO THE DENTAL PROFESSION—A PRELIMINARY INJUNCTION TO RESTRAIN DENTISTS FROM USING HARD RUBBER IN MAKING DENTAL PLATES DENIED.

Goodyear & Cummings *against* Thomas G. Wait, et al.

This was a motion for a preliminary injunction restraining defendants from using hard rubber in making dental plates. After argument by Messrs. Keller and Blake for plaintiffs, and Messrs. Curtis and Law for defendants, the court denied the motion and refused to interfere at all prior to a final hearing. This is a question of great importance to the dental profession, and, in fact, to the public generally; this denial probably foreshadowing the result of the final hearing, which, if it results in favor of the dentists, will prevent an increase in the price of sets of teeth made of hard rubber.

PERISCOPE OF MEDICAL AND GENERAL SCIENCE IN THEIR RELATIONS TO DENTISTRY.

BY GEO. J. ZIEGLER, M.D.

"*The Philosophy of Food.*—In 1842, LIEBIG, in his 'Organic Chemistry,' broached the idea that all articles of food were capable of arrangement into two great groups, the one devoted to the reparation of the tissues, the other to the production of animal heat. These were respectively denominated the plastic or nutritive, and the calorifacient divisions. Up to the present date this distinction has been looked upon as perfectly established, and as such is quoted in all our physiological text-books even of the most recent date. Many of our readers will therefore, we doubt not, be somewhat astonished when we say that such a grouping can no longer be upheld—in short, that our ideas as to the various purposes fulfilled by different articles of diet must undergo a complete revolution.

"In his 'Letters on Chemistry,' Liebig tells us that 'the sulphurized and nitrogenous constituents of food determine the continuance of the manifestations of force; the non-nitrogenous serve to produce heat. The former are the builders of organs and organized structures, and the producers of force; the latter support the respiratory process—they are the materials for respiration.' No doubt, when this notion was first brought forward, it was a very great advance on the knowledge men previously possessed as to the functions of the different kinds of food, but the story we have got to tell just shows as clearly the danger of accepting anything as ultimate in such a science as medicine.

"As will be seen from the quotation made above, Liebig assumed that all force or energy depended on the oxidation of muscle, and that these organs could only be repaired or nourished by azotized articles of food; in other words, that nitrogenous alimentary matters were the only substances capable of giving rise to force, and that only after their conversion into muscle. Liebig's doctrines did not even then go altogether unchallenged, for Mayer opposed them almost as soon as they were announced; but all contrary views had been well-nigh forgotten when the doctrine of the 'conservation of energy' began to be applied to animal as well as to inorganic physics, and this has furnished the clew necessary to the elucidation of the problem as to what is the real function of food, and the true origin of force. The inquirers who have been most successful this way have been Dr. E. Smith, and Professors Fick, Wislicenus and Frankland. The researches of Dr. Smith, although undertaken for a different purpose, have been highly instrumental in bringing about the result hinted at, but the others have devoted themselves solely to the determination of the question. Messrs. Lawes and Gilbert had also, by pursuing a line of inquiry entirely different from that adopted by the above-mentioned gentlemen, arrived at conclusions almost identical with theirs. But, to enable our readers to form their own opinions, we must point out the different steps in the inquiry.

"Seeing, as is universally admitted, that muscular contraction is the great, if not the sole, motive power within the body, and seeing also that chemical change universally accompanies, in fact may be said to be *the*

condition of, the development of this force, the products of oxidation (for all admit the change to be of this nature) must always bear a direct ratio to the force developed, so that the latter may be measured by the former. There are two great channels for the escape of refuse material from the system—the lungs and the kidneys. By the former, burnt-up carbon, in the shape of carbonic acid, passes out; and by the latter, decomposed nitrogenous substances, in the shape of urea, uric acid, and hippuric acid, make their exit. According to Liebig's notions, the carbonic acid is derived from the oxidation of the calorifacient articles of food, the heat evolved during the change keeping up the temperature of the animal to a fixed standard, while the urea (for the amount of the others is so slight that they may be left out of the question) mostly originates in the change of muscular tissue when in a state of activity. Assuming this as true, the carbonic acid exhaled by the lungs should be, to a certain extent, a measure of the amount of non-nitrogenous matter consumed in the body, while the urea would serve to indicate the amount of muscular force expended. In the *Philosophical Transactions* for 1859 and 1861, Dr. E. Smith published the results of a very remarkable series of inquiries which first of all threw upon this doctrine a shadow of doubt; for in the first of these he showed conclusively that the carbonic acid which passed out from the lungs varied extremely from time to time, and that the great agent in causing this variation was bodily exertion. Food, no doubt, has, to a certain extent, the power of increasing the expired carbonic acid; but it goes on with great uniformity in the entire absence of food. Thus he estimated that while in people sitting quietly 26·193 ounces of carbonic acid are exhaled in twenty-four hours, those who work expire 31·824 ounces, the hard-wrought daily laborer evolving as much as 43 ounces. Putting this in the comparative form, which is even more striking, it will be found that the amount of carbonic acid exhaled in one hour, when a person is walking at the rate of two miles an hour, is equal to that exhaled by one sitting quietly, during one and four-fifth hours with food, or in two and a half hours without food. Again, the carbonic acid exhaled by one walking at the rate of three miles during an hour is equal to the carbonic acid exhaled by the same individual in two and three-quarter hours while sitting and with food, or in three and a half hours without food. But the difference is still more remarkable in one working at the treadmill, for the carbonic acid evolved in one hour is as much as would appear were he sitting in four and a half hours with food, or in six without food.

"Dr. Smith's next step was to ascertain, as food evidently had some effect upon the amount of carbonic acid expelled by an individual, what kinds of food had most influence this way. Here again his results are surprising to those who are still inclined to hold with Liebig, for he came to the conclusion that the substances which are most powerful as exciters of respiration, or of the evolution of carbonic acid, are the nitrogenous articles of food, milk, tea, coffee, rum, beer, sugar, cereals, and potatoes; while the great heat-producers of Liebig—starch and fat—have actually no effect whatever on the exhalation of this substance except exercise follows their absorption. One more point had to be settled, viz., the amount of nitrogen which passes out of the body in a state of quietude and in a state of exertion. To this inquiry Dr. Smith, after a long-continued series of investigations, was able to return an answer, and that too in no doubtful tone, that whereas exertion did not appear to have any

influence over the excretion of urea, food had a very powerful one; in other words, that the nitrogen expelled from the body did not vary with the work done by the nitrogenous tissues, but with the quantity and quality of the food consumed. Such deductions could not do otherwise than excite at least a suspicion, in the minds of inquiring men, that things were not exactly as they were represented to be, although absolutely conclusive data were still wanting. But by this time the correlations of the physical forces had been firmly established, and Mr. Joule, of Manchester, had been able to show the exact bearing heat had to force, in his well-known 'unit,' viz., that the concussion produced by the fall of one kilogram through 425 metres produces enough heat to raise one kilogram of water 1° C. in temperature. The heat produced then was to be taken as a measure of the amount of force developed in the body, and this heat was to be measured by estimating the temperature which would result from converting albumen into urea, the amount of this last substance being known. Professors Fick and Wislicenus, of Zurich, devoted themselves to the inquiry, and the plan they hit upon was to ascend a mountain known as the Faulhorn. as it happened best to suit their purpose. For some time before and during the experiment, no nitrogenous food was taken, starch fat, and sugar forming their only aliment. The conditions of their experiment were, therefore, to ascertain the exact amount of nitrogenous matter escaping from the body, thence to deduce the amount of heat evolved in the formation of these from albumen, by which means the amount of force developed could be easily ascertained. Again, the height of the mountain was known, and the weight of the experimenters, along with their accoutrements, was readily determined, so that the amount of work to be done would be ascertained by multiplying the one into the other. But the ascent of the mountain was not the only work done by the muscular system, for both respiration and circulation had to be kept up. From certain data, to which we need not here allude, the amount of force so consumed in Fick's case was estimated at 5197 metre-kilograms for the former, and 25,344 metre-kilograms for the latter, which, added to the amount of apparent work done, came to 159,637 metre-kilograms as the total work performed by Fick, that by Wislicenus being estimated at 184,287 metre-kilograms. At the time of which we speak, the heat evolved by burning albumen had not been ascertained, so that their experiment was necessarily incomplete, but this final step in the investigation has been made by Dr. Frankland, of the Royal Institution, so that we are now in a position to solve the problem.

"From the inquiries of Ranke and Thiry it is known that little or no nitrogen escapes by the skin or by the lungs, but that the whole passes out by the kidneys. Accordingly, the urine passed by the experimenters for some time before, during, and after the ascent was carefully analyzed, and the amount of nitrogen contained in it accurately determined, as was also the weight of muscle which would contain the given amount of nitrogen. Now, from the conditions of the experiment, little or no nitrogen could have existed in the state of urea within the system prior to its commencement, and it may be assumed that as little remained behind at its termination. We see, then, that by combining the exact researches of Frankland with those of our Continental brethren the amount of energy developed in the conversion of albuminous muscular tissue into a known weight of urea and uric acid can be exactly determined, and this estimate compared with the work known to have been accomplished.

First of all, the amount of muscle consumed amounted to 37·17 grams in the case of Fick, and 37 in that of Wislicenus. Now the force capable of being generated by the oxidation of these quantities of muscle (within the body) amounts only to 68,690 metre-kilograms of force for Fick, and 68,376 for Wislicenus, so that by contrasting this with the work known to have been performed we find—

	Fick.	Wislicenus.
Total ascertainable work done in metre-kilograms	159,637	184,287
Work accounted for by the oxidation of their muscles	68,690	68,376
Unaccounted for	90,947	115,911

"But great as this amount may be, it is not the whole, for it must be borne in mind that all the heat developed is not converted into force; even in the best constructed steam engine only one-tenth is so transformed, but the human system—a far more perfect machine—does not allow of so much waste, insomuch that, as Helmholtz calculates, one-fifth of the energy developed can be made to appear as work. Assuming, however, the higher estimate of Haidenhain, we find that the work ascertained to have been accomplished must at least be doubled, since we are calculating from heat, giving us, therefore, 319,274 metre-kilograms of work done for Fick, and 368,574 for Wislicenus, so that scarcely one-fifth of the energy actually put forth can be accounted for by the disintegration and oxidation of muscular tissue. Were it necessary, we might quote other instances from Dr. Frankland's lecture delivered at the Royal Institution (June 8, 1866), for all observations read by the light of our recently-acquired knowledge lead to the same conclusion. Dr. Smith, Haughton, Playfair—all, in fact, who have in any way engaged in the investigation—will unite with us when we say that our ideas as to food and muscular action must be materially changed, for their researches indubitably show that force does not necessarily depend on the oxidation of muscle, nor even that it can all be accounted for, by the nitrogenous articles of diet usually consumed. Nor does the statement just made depend on the scientific proof adduced by the above-mentioned investigators alone; for Messrs. Lawes and Gilbert, from their experiments on the best means of feeding cattle, even before the ideas just enunciated had been brought forward, were able to say that the value of fodder as an article of diet for graminivorous animals did not depend on the amount of nitrogenous matter, but rather on the non-azotized substances which it contained. They further found that by merely increasing the amount of nitrogen in the food of an animal, they could double the amount of urea excreted by it, although the conditions as to muscular excretion were identical in the two cases.

"What, therefore, results from all this? It seems to us that there can be but one answer to such a question, and that is that the ideas even now prevalent as to the values of different articles of food are altogether wrong, and that we must make up our minds to a total alteration in our notions as to their applicability to the cases we had hitherto assumed them best adapted for. But it shows something more, if we mistake not; for had we all this time attended to the teachings of experience, we might have known otherwise, since we invariably see, that wherever a large amount of work has to be done, the diet of the workers contains a much larger percentage of non-azotized matter than when but little exertion is required. Yet, on the other hand, it is quite true that a sufficient

amount of nitrogenous matter will enable an animal to subsist and to perform almost any amount of work. How otherwise could we account for the existence of purely carnivorous animals? Again, from the observations of Sir Francis Head, made during his excursion over the Pampas of South America, we know that the food of the Guachos who inhabit that district consists of nothing but beef, and that so lean and tough, says he, that no one would be induced to eat more of it than was absolutely necessary to sustain life. Among the trappers and hunters of North America, it is a common thing for a man to be months without tasting bread or anything of the kind, their only substitute for salt even being gunpowder. Turn, on the other hand, to the food of the agricultural laborer in Scotland; we find them there subsisting from one year's end to the other on oatmeal and milk, while in harvest, when they usually work twelve hours a day, small beer is sometimes substituted for the milk, thus still further lessening the supply of nitrogenous matter. The navigators, again, who construct our railways, as noticed by Dr. Frankland, feed to a great extent on bread and fat bacon; and it is a well-known fact that the brown bread, so often used among the well-to-do classes, is invariably rejected by workmen in favor of white bread—that is, the bread which contains the greatest amount of nitrogen is rejected for that which contains most carbon. When there were slaves in America, almost the only animal food (except what was procured by hunting) they obtained was fat bacon; and all know well that fat pork, so much relished by the hard-working classes, is almost, if not entirely, unknown on the tables of those who have but little exertion to go through, being there replaced by highly azotized substances, such as, we shall say, the different kinds of game. Still further, does not fat salted pork furnish one of the most important articles of diet in the case of that very hard-worked class, sailors; and, in fact, wherever much exertion has to be made, do we not find the same rule prevail? Dr. Piccard tells us that when chamois hunters are starting on a long and toilsome expedition, they take with them as provisions only bacon-fat and sugar, which, say they, contain most nourishment in least space.

"What say our friends who have been accustomed to diet their patients on scientific principles to all this long array of facts? Surely there can be but one conclusion, and that is that experience is better than science as a guide to the management of the human frame. Upon what scientific foundation, shall we say, do the curative effects of quinine in ague rest, putting in the mean time Dr. Bence Jones' researches out of view? Yet who would hesitate to prescribe it in any case of the kind? So say we with regard to diet: what a man finds good for himself, let him stick to; what he finds to disagree, let him avoid. No one man can in this case be a guide to another, except he be placed in exactly the same position in every respect; and how rarely do we find this to be the case!

"Fick, in his paper (*Phil. Mag.*, June, 1866), makes good use of the steam engine as a simile, and really the correspondence of this with the human body is closer than would at first sight be suspected. The steam engine is a composite machine, made up, we shall say, of iron and brass. So is the body composite; but without the motive power in the shape of fuel, it is motionless. So with the body and food. But steam engines wear out and require repair; so do albuminous muscles, and, therefore, a certain amount of nitrogenous matter must be taken into the system, that

the organism may be sustained in a proper condition. But a steam engine, although in the highest state of repair, is nothing without fuel; so the body requires food, a certain quantity of a nitrogenous kind no doubt, but the rest may be either nitrogenous or non-nitrogenous, so long as its oxidation originates force. In both cases certain *débris* is left behind; but because we find iron and brass in the one case and urea in the other, we cannot therefore conclude that the working of either machine has produced these and these only. In both cases we must look for the carbonic acid evolved. Notwithstanding all this, we cannot in the face of ascertained facts go as far as Fick and Traube, who would have us believe that it is only non-nitrogenous matter that can be converted into force through the agency of muscle. That we can scarcely admit; still their researches are of great value, were it only to show that we have not arrived at the uttermost bounds of scientific knowledge even in that direction where its limits were supposed to be so well defined. Finally, we must again affirm that science is good; none can appreciate it more than we do; but when science contradicts the accumulated experience of ages, then, say we, *cedant arma togæ*—experience for us, let science go to the wall."*—(*Med. Times and Gazette.*)

"*On the Superior Utility of Whole Meal Bread as a Daily Ingredient in Human Sustenance.* By HENRY MCCORMAC, M.D.—The disuse of whole meal bread I esteem a positive drawback in our civilization. I do not think that there is an adequate consumption of the food that the grasses, the potherbs, and the beans or pulse, which GOD bestows on us, are so well calculated to yield. Our principal, and really very imperfect substitutes for the production of the vegetable world are wheaten bread and potatoes. Potatoes, to be sure, are a great stand-by, but they are not enough. And, then, in the spring months they deteriorate very rapidly, and no longer constitute a desirable exclusive, or even partial nourishment. Wheaten bread, then, is our great resort. It has come to be the principal representative of the vegetable world. Wheat is a great, nay, an admirable gift of Providence. But we vitiate that gift by our own improvident and injudicious management. Loaves, to save room in the oven, are crammed close together in the act of baking. The consequence of this is that the oven is overheated in order to strike down through the mass of paste. An immensely thick and hard crust is formed at the top and bottom of the loaf, while the rest of it is most undesirably left without any crust whatever. Now, loaves should be crusted all over. The bread would be much better baked, the top and bottom crusts would not be so hard, and the loaf would prove at once more wholesome and palatable. I will not enter here into the consideration of mouldy bread, and of bread with excess of water, and it is all too watery. Nor shall I speak of the various adulterations or perversions to which dishonest persons have had recourse for their own profit and to the public bane. I here wish merely, or at least principally, to dwell on the great evil of omitting the bran in the confection of bread. By leaving out the bran we injure the bread's efficiency, we lose a noteworthy portion of azote as well as a considerable amount of the phosphates, both of them of the

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* Science is truth. Truth is fact or reality. It is an unit with innumerable phases, some in apparent antagonism, but all in direct unison with each other. Science, therefore, can never be false, but may be misapprehended and misinterpreted.—Z.

utmost moment even when bread is but a partial ingredient in the general nutriment, but yet much more so when, as in the case of hard-working men and women, as well as children, it constitutes the principal sustenance.*

"The increase of the factory population, together with the ready facility which cooked food, in the shape of bread, yields, has led to a vast increase in the use of bread. To a great, and, indeed, most undesirable extent, bread is consumed at the dinner meal, not as a portion, but, along with a little sugared hot water called tea, as in fact the entire nourishment. Owing to the absence of the bran habitual constipation, among those who mainly consume such bread, ensues. And, owing to the partial absence of nitrogen and of the sufficient phosphates, the body is not adequately supported. Habitual dyspepsia and debility, and in females amenorrhœa ensue, and the whole system, along with the bodily powers which ought to sustain that system, deteriorates. The evils which thus accrue from this wretched, ill-baked, watery bread, alike deficient in nitrogen and the phosphates, eaten, as it commonly is, three times daily, I really have no fitting terms to describe."—(*Med. Press and Circular* and *Med. News.*)

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Dental Caries.—In a communication to the *Lancet*, DR. J. PIDDUCK offers the following on this subject: "In your able article on the dental specialty, you conclude your valuable observations by saying, 'Our respect for the dental department of medicine will be increased when it shall once determine the causes of caries, so as either to remove or arrest them.' To know the causes of injury to the teeth is more than half way toward their removal. These causes are twofold: first, food containing too little of the osteo-phosphate of lime, such as the fine whiten bread deprived of bran; and secondly, the adulteration of alum. The first is negatively, the second positively injurious; the first by depriving the teeth of the material necessary for their perfect development, and the second by acting as a solvent of the enamel.

"The administration of the osteo-phosphate of lime and iron in the form of small cakes during the first and second dentition, and avoiding bread adulterated with alum, is the most effectual mode of preventing caries."

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"*Changes in Nutrition dependent on altered Nerve-influence.*—DR. OGLE drew the attention of the students of St. George's Hospital to a preparation in the hospital museum, showing the union of a divided carpal nerve of a horse, three-quarters of an inch of the nerve having

* It is desirable for every reason, and especially for the sake of change, to encourage the confection of every variety of really good household bread, griddle bread, loaves baked in a brick oven or in the oven of the close kitchen-range. Potato cake, wheaten cake, rice cake, are all good. When rice or potatoes are used, they ought to be employed warm. A very nice sort of pancake is made from a batter of flour and milk, sweet or sour, and even of flour and water. The poor, and also some who are not poor, use soda in large quantities for raising bread. It is a great mistake, and is calculated to injure the tone of the stomach. Baking-powders are never desirable, and are sometimes quite pernicious. A much better resort is the bicarbonate of soda, baking soda, neutralized by the addition of muriatic acid, so as to convert it into table salt. The following procedure answers well: To every pound of flour or meal add 40 grains of baking soda, a pinch of salt, and a little sugar. Mix intimately. Then add 50 drops of muriatic acid in half a pint of water. Knead smartly and thoroughly. Divide into two rolls, and bake in a quick oven or on a hot plate with a cover.

been removed. This operation was performed owing to some disease in the foot, which was cured. But, as a result apparently of the division of the nerve, the hoof of the foot in question '*grew to a greater size than usual.*' As being facts of an analogous character, he also alluded to the condition of the skin and nails often observed in paralyzed parts, and in limbs the nerves of which have been injured—on the one hand, the roughness and harshness, evidently the result of unusual development and desquamation of epidermis; on the other hand, the unusual smoothness, defective hair-growth, etc.; again, the unusual dryness or moisture of such parts. These various conditions were evidently, Dr. Ogle added, connected with modifications or perversions of nerve-influence, whether such nerve-power is to be considered as acting on the growth and influencing the condition of parts by virtue merely of its influence on the calibre and condition of the minute vessels of the region, or by reason of a direct influence on or control of the nutritive and molecular processes, independent of the capillaries."—(*Med. Times and Gaz.*)

Malformed Teeth from Hereditary Syphilis.—It is stated (*Lancet*) that "Professor MACNAMARA confirms from his Indian experience the accuracy of Mr. Jonathan Hutchinson's admirable observations on the association of notched and pegtop forms of the upper central incisors with interstitial keratitis in cases of inherited syphilis."

"*Case of Reproduction of Tooth after Gunshot Wound of Maxillary Bone.* By JAMES S. BLAIN, M.D., of Brunswick, Georgia.—As it is the duty of each member of our profession to contribute as much as possible to the advancement of medical knowledge and science, and to give publicity to any facts, either new or strange, which may come under their observation, I propose to report a case which, though it may be of no great practical benefit to the profession, may still be of interest as illustrating the wondrous reparative power of nature.

"I have no notes of the following case, and in consequence will necessarily be compelled to avoid detail.

"Lt. E. W. Blount, of the 26th Regt. Ga. Vols., Gordon's Brigade, was wounded, if I mistake not, at the battle of Spottsylvania Court House, in 1864. A Minié ball passed in at one side of his face and out at the other, fracturing the superior maxillary bone on the left side and the inferior on the right, and nearly severing the tongue. When operated upon, a portion of the inferior maxillary bone, including the second bicuspid tooth, was resected. His recovery was for a long time extremely doubtful, but by kind treatment, and a naturally robust constitution, he was finally restored to health. A few days since he called at my office to see me, and, upon examination, I found that cartilaginous union had taken place between the divided ends of bone, and that, in this cartilage, *nature* had *reproduced* the tooth which, as above mentioned, was removed with the resected portion of bone. Lieut. B. is now in the enjoyment of good health, and though the motion of the inferior maxillary is very imperfect, still it is sufficient for the performance of the functions of life."—(*Nashville Jour. Med. and Surgery.*)

Dermoid Cysts with Teeth.—"Three instances of 'dermoid cysts' are reported in the Transactions of the Obstetrical Society, one by Dr. Tyler Smith, which was passed per rectum with teeth attached. One by Dr.

Woodman, attached to the right ovary, which was itself converted into a polycystic tumor. Two rudimentary teeth and hairs grew from the inside. A third by the late Dr. Ritchie. This was developed in the fallopian tube; it was as large as a plum, contained four loculi filled with a creamy fluid, and a plate of true bone."—(*Brit. and For. Med.-Chir. Rev.*)

"*On the Use of Carbolic Acid.* From the Proceedings of the Odontological Society, June 5th, 1865. By Mr. Woodhouse and Mr. Gibbons.—From the statements made in this paper by the authors, illustrated by cases, it would appear that carbolic acid or phenole is very useful in dental surgery, applied with caution, by means of cotton-wool, care being taken to avoid touching the lips, which it excoriates. It is described as relieving pain without occasioning inflammation; and that where suppuration has set in, it arrests that process. It is stated to be pre-eminently useful in cases of exposure of the pulp. For minute details and precautions as to the mode of employing it, we must refer to the paper itself."—(*Ibid.*)

Relative Effects of Potassium and Sodium Salts on the Animal Economy.—In one of his able lectures on chemical and mechanical diseases, Dr. H. B. Jones states (*Med. Times and Gaz.*): "The effects of salts of potassium, compared with the effects of sodium salts, show that salts of potassium act very strongly on muscular contractility. When salts of potassium are injected into the blood, the pulse falls rapidly, and the pressure of the blood, when accurately measured, rises for the first few minutes and then falls, and if the injection is then repeated the heart stops beating.

"A muscle, by the application of potassium salts, may be rendered unexcitable to the stimulus of electricity, and it may be restored by treatment with sodium salts. A nerve, also, when treated with potassium salt, loses much quicker its power of exciting contractions in a muscle than when a similar nerve is treated with sodium salt. Even a nerve of sensation, as in a tooth, may lose its power when treated with potassium salt.

"So remarkable are the phenomena that even a similarity has been stated to exist between the action of potassium salts and digitaline.

"Microscopic observation shows that chloride of potassium may affect the blood-globules, making them contracted and granular, while chloride of sodium has no action of this kind."

"*Poisoning by Silk Thread.*—The silk thread used by seamstresses is liable to acquire poisonous properties in consequence of a fraudulent practice described as follows in the *Moniteur de Hygiène et Salubrité Publique*, by Mr. Chevallier, Jun., the director of that periodical.

"'The value of the best quality of silk varies from sixty to seventy francs a pound, and the material is sold wholesale by weight. For many years it has been the custom to increase the weight by steeping the silk in sugar and water, or in an infusion of gall-nuts; but this fraud not being found to yield sufficiently large profits a patent was taken out for another plan, which consists in soaking the silk, whatever its color, in a bath of acetate of lead, and after drying the skeins, exposing them to a current of hydrosulphuric acid. The result is the deposition of a quantity of sulphuret of lead which greatly adds to the weight of the thread, and, there-

fore, to its mercantile value. We are acquainted with a person at the head of an extensive dress-maker's establishment who, from the use of silk thread thus prepared, was attacked, as well as her workwomen, with painters' colic; some of the women even lost their teeth, in consequence of their habit of biting off the ends of the thread, an operation during which they absorb a portion of the lead attached to it.

"'The following is an easy method of discovering the fraud, which is sometimes carried so far that some silks have been found to contain as much as 23 per cent. of their weight of sulphuret of lead. Place a few threads at the upper part of a tube closed at its inferior extremity, and moisten them slightly with water containing a small amount of acetic acid or strong vinegar. When the silk is impregnated, add a few drops of solution of iodide of potassium. If any lead be present, a golden deposit of iodide of lead will at once betray the adulteration: and the weight of the iodide formed, and that of the silk before and after the operation, drying included, affords a clew to the quantity of lead introduced to deceive the purchaser; a dangerous kind of fraud, inasmuch as the action of the poison is slow and insidious and entails injury to the teeth, general intoxication of the system, paralysis of the intestines, and may even cause death.'"—(*Jour. Practical Med. and Surg.* and *New York Med. Jour.*)

Arrest of Hæmorrhage by Xylo-styptic Ether.—Sidney Chater, in a note to the *Lancet*, testifies to the value of the xylo-styptic ether for arresting hæmorrhage. He says: "I have myself had an opportunity of applying it, in which it was most successful, but had refrained from publishing the case, hoping to have had others to publish with it.

"The case I refer to was one of removal of necrosed bone from the elbow, by Dr. Crosby, who, having tried in vain to arrest hæmorrhage from a minor vessel or two by means of a ligature, asked me to apply a jet of the xylo-styptic ether. I did so, and in less than twenty seconds all bleeding had ceased by the formation of a sort of serum over the whole surface, or I should rather say inside the whole of the wound. Hæmorrhage never recurred, and the patient did well.

"Should any of your readers have had an opportunity of using this ether, would they kindly publish their experience for the benefit of those who take an interest in such matters?"

Local Anæsthesia.—The *Lancet* states that "Dr. le Play has devised an ingenious instrument, in which the pulverization of the ether is effected, not by hand propelled air, but by a stream of carbonic acid gas, generated under a certain pressure. The author would have achieved much if he had merely suggested the important idea of substituting the mechanical action of an expansive gas for the laborious hand-pressure of the ordinary apparatus. But he, justly as we think, hopes for more than this; for it is highly probable that the union of carbonic acid gas, or of other gases which may be made to serve as automatic pulverizers, with the ether spray, may greatly increase our power of local medication of diseased and painful surfaces, independently of its merits, as yet not properly tested, as a surgical anæsthetic. The subject deserves immediate and general attention from the profession."

Local Anæsthesia. Dr. Richardson's Apparatus.—The inflammability of ether is so great as to render it dangerous for anæsthetic purposes by fire light. This is strikingly illustrated by the following incident related by a correspondent of the *Lancet*, who urges "the necessity of great precautions in the employment of the above instrument for the extraction of teeth at night.

"I have used Dr. Richardson's spray producer for some little time, and can cheerfully testify to its beneficial aid in minor surgical operations, especially dental, in no case occasioning the slightest pain, with the exception of a solitary eye tooth, whose body was twisted, and whose fangs were curved. The instrument I have used by daylight and gaslight, with no danger attending till the other evening, when the fright which patient, attendant, and myself experienced determined me to operate by daylight only.

"A gentleman calling to have a tooth extracted, I proceeded in the usual way. Having applied a small piece of cotton wadding over the tongue, with the view of protecting it from the fluid which I was about to direct upon the upper jaw, I commenced business. I should say that in *every* preceding instance I have used a candle, to throw a better light into the mouth. This is held by the assistant not nearer than half a yard from the seat of operation. In this case it was done also. And now comes the terrible scene. I had scarcely used the ether (pure rectified) for twenty seconds, when suddenly a volume of flame rushed from the patient's mouth, enveloping the three of us for a single instant. It was so soon over that the patient had not time to rise from his seat, and the assistant and myself remained in our former positions. There was no explosion; all was quiet. After regarding each other for a few moments, I ventured to inquire of the patient how he felt. I was happy to see a smile, rather ghastly nevertheless, illumine his pale countenance; but his only answer was, 'What a wonderful occurrence!' There was no smell of scorching; the only injury sustained being a slight singeing of the more prominent hairs of his moustache. The assistant and myself were untouched. This was certainly an unexpected and terrible occurrence, though fortunately unattended by any untoward result. The patient's complexion was of a healthy, ruddy color on sitting down for operation; but this soon gave place to a ghost-like pallor; and when I beheld the flames gushing forth from his mouth, I almost believed it was a veritable fire-demon sitting before me. He certainly did not look ethereal. The only unpleasant feeling he experienced was a sense of constriction round his neck. He is nothing the worse of it; in fact, better, as he has not felt a twinge of toothache since.

"Now, cases like these are not to be made *light* of. The cause of the mischief might be attributed to the candle. If so, then why did the same effects not ensue in preceding instances, as the same precautions were adopted? I should esteem it a favor to be informed if any rules are laid down for operating in gaslight, as till then I shall be obliged to desist."

Inflammability of Ether.—W. B. Burn, M.R.C.S.E., thus comments upon the case above mentioned (*Lancet*): "I beg to inform 'S. E. K.,' that the cause of his ether taking fire may be easily explained.

"Ether, one of the lightest fluids known, has a vapor of the greatest density; much heavier is it than carbonic acid gas (the weight of which is well known); for while carbonic acid gas is one and a half times

heavier than atmospheric air (sp. gr. 1·524), ether vapor is two and a half times heavier (sp. gr. 2·586). A small quantity of ether placed in a bottle is soon converted into vapor, which can then be poured out, and may be *seen* to fall downward if held in a particular position.

"Now I doubt not the candle was held lower than the ether, and the inflammable vapor ran down on to the candle. I suspect the reason of an accident not happening before was that the operations were on the lower jaw, where the light is best thrown from above; but this was on the upper, where one would naturally lower the light to obtain a good view.

"'Daylight is best in all operations;' but ether may be used as safely by artificial light as by day, provided the source of light be well raised above the place of operation. A fire is of course as dangerous by day as by night.

"A light from above answers well in most operations; in extracting teeth from the lower jaw, extremely well. For the upper jaw the light may be reflected into the mouth, by a concave mirror best; by a common looking-glass sufficiently well."

In relation to the same, another writer, W. H. B., observes (*Ibid.*): "Your correspondent's adventure while using Dr. Richardson's ether spray, reminds me of an event even more portentous which occurred to myself and a patient some years ago in one of the metropolitan hospitals, to which I was then house-surgeon.

"This man was taking compound spirit of ether and other spirituous stimulants freely, and I suppose had recently swallowed a dose when I had occasion to examine the fauces very carefully by candle-light. One hand was engaged in depressing his tongue, the other held the candle close to the patient's lips, when an effort at vomiting, induced by the manipulations, brought up a large volume of gas. Withdrawing my face rapidly to avoid this, I just escaped a burst of flame which shot from his mouth to a distance of eighteen inches or more, startling the pair of us and the attendant most considerably. Finding the patient no worse, I laughed heartily; but he did not seem to see the joke, and declined any further experiment for that evening.

"To utilize this, it is worth knowing that illumination of any part of the mouth may be more conveniently and perfectly effected by reflection from a concave mirror, such as is used for laryngoscopic or ophthalmoscopic purposes, than by direct light, whether natural or artificial. Examinations can also by this means be easily made in the recumbent posture, a matter sometimes of some importance."

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"*Death from Mixed Vapors.*—Two cases of death from mixed vapors of ether and chloroform are referred to in the *Observer* newspaper. Hitherto it was believed that the mixed vapors were harmless."—(*Dublin Med. Press.*)

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Sulphur and its Compounds.—"The next division of our subject is one of considerable comprehensiveness and importance. It is that of sulphur and the compounds of sulphur which exist in nature. Of course I shall treat of this department only in reference to geological considerations.

"Now, sulphur is, as you know, an elementary body—that is to say, by no known process can it be resolved into simpler forms of matter.

Treat it, torture it, as we may, it remains sulphur forever. There is another element very analogous to it in chemical relations, namely, selenium—a body discovered by Berzelius a great many years ago. Here is a specimen of selenium cast in the form of a medal. These two bodies sometimes occur together; but selenium is of very rare occurrence in nature compared with sulphur. Sulphur burns, you know, with access of air, forming sulphurous acid. We are all familiar with the fumes of burning sulphur; that is nothing more than sulphur united to oxygen chemically, in the form of sulphurous acid. There are various other kinds of combinations and acids. There is sulphuric acid, and there are other sulphur acids.

"Sulphur occurs abundantly in nature, even in a state of isolation. Here is a fine specimen of crystallized native sulphur. It is essentially a volcanic emanation, as we shall observe hereafter when we come to treat of volcanic action. It exists to a very large extent in the earth's crust, in combination with metals, forming sulphides. It is also present to a very large extent in the state of salts, saline combinations—in the form especially of sulphate of lime, with which you are familiar under the name of gypsum.

"Let us first examine these sulphides in a general way. Now, sulphur has a very powerful affinity for many metals. Take, in illustration, the familiar experiment with iron so often performed by youths at a smith's fire. Obtain a piece of iron, heat it to whiteness, and touch it with sulphur. Instantly the iron trickles down as liquid as water, a combination of iron and sulphur having taken place. Take, again, a little lead, heat it with sulphur, and a combination takes place accompanied by the phenomenon of incandescence. In fact, sulphur combines with many metals, producing great heat and light—in other words, causing incandescence.

"We will study in detail some of the most important sulphides which we meet with. They differ considerably in their properties, but they are all solid. They are either amorphous—that is, without form—or they are crystallized. They sometimes occur magnificently crystallized. Look at this specimen of iron pyrites. It is, as you observe, distinctly crystallized, and sometimes we obtain it in very fine crystals—large cubes or modifications of the cube, and also in other crystalline forms. Take, again, common galena, sulphide of lead: here it is, forming a large crystalline mass. Here you can trace distinctly the form of cubes. Again, you have these sulphides presenting a metallic appearance. Here is one which some persons would pronounce a metallic substance, but it is merely a metallic compound. Then, again, we have a compound of sulphur and mercury, which is without any metallic lustre. Here, again, is a combination of sulphur and antimony. What is very singular is that we may have the same sulphide in two distinct forms, each of them possessing precisely the same chemical composition, and yet no two bodies differing more in external characters than these two forms of the same sulphide. I could place before you several illustrations of this fact. Here is some sulphide of bismuth which has been thrown down from a solution of bismuth. It is in the form of a black powder, perfectly non-metallic in appearance. Take this black powder, expose it to a good red heat, and you then obtain a beautifully crystallized body having a decided metallic lustre. But here is, perhaps, one of the most striking illustrations you can have. You see this orange powder. It is nothing more than sulphide of antimony thrown down in contact with sulphur from solution. This other speci-

men is the same compound after being exposed to a red heat and melted. You see it now possesses a bright metallic lustre. There are also different forms of sulphide of mercury. Here it is in the state of common cinnabar, a black powder. If I take this black powder and expose it to a high temperature in a glass vessel, which is essential in this case, I then get this brick-red powder, which has the same composition per cent. Then, again, by taking this dull-red powder and submitting it to a certain treatment, I obtain this beautiful body, vermilion, which has precisely the same composition. These three forms are all sulphide of mercury, all having the same constitution, and yet you see how different they are in external appearance.

"Some of the sulphides are very fusible. As a general rule, the sulphides of the more fusible metals, such as lead and tin, fuse at a much higher temperature than those metals. On the other hand, the sulphides of the more difficultly fusible metals—iron, for example—fuse at a much lower temperature than those metals. There are exceptions, however, to this rule; still it is generally true. The temperature at which they fuse varies considerably. Some are perfectly fixed at whatever temperatures we expose them to. Take a certain compound of sulphur and copper which occurs in nature, the disulphide. If I heat it in a close vessel—(I demand that condition)—I may expose it to the highest temperature we can command in our furnaces, and it undergoes no change whatever. Again, if I take iron pyrites and heat it in a close vessel to the highest temperature I can, it undergoes no change; but if I heat it openly to a good red heat, it then loses about half its sulphur. Other sulphides sublime when heated, and we find such sulphides in volcanic emanations. Sulphide of mercury, for example, is one capable of being thus sublimed. Sulphide of arsenic, also, can be sublimed. There are some points of considerable interest in connection with the sublimation of these sulphides. Take, for instance, common galena, sulphide of lead. I have seen this body beautifully sublimed in blast furnaces when lead slag was being melted. Beautiful crystals of sulphide of lead have been seen in the upper part of the furnace, showing that it has been sublimed. But then this sublimation can only take place with the exclusion of oxygen. If oxygen have access, you burn out the sulphur and oxidize the metal. In fact, you get a series of changes of great interest in a metallurgical point of view, but which I have not time to dwell upon. The changes which take place by exposing these sulphides to the action of heat and air are very important, and lie at the foundation of some of the most important processes for the extraction of metals from their ores, especially copper, lead, and silver. The sulphides of many of the metals are frequently decomposed by steam at a high temperature. The sulphur goes away in combination with the hydrogen as sulphuretted hydrogen, and the metal becomes oxidized at the expense of the oxygen of the steam."—(*Ext. from Lecture by* DR. PERCY, *Chem. News.*)

"*Old Collodion.—Humphrey's Journal* says that old collodion may be rejuvenated and made useful in the following manner: 'Add alcohol and ether in equal parts, or a mixture of one-third alcohol and two-thirds ether is still better—until the collodion flows easily and is thin enough to coat the plate without streaks; furthermore, to each quart of collodion add sixty grains of bromide of cadmium, and put the mixture, after frequent shaking, in a cool, dark place. This collodion probably will

become colorless and work as well perhaps as the best new collodion that can be made.'"—(*Sci. Amer.*)

"*Singular Quality in Steel.*—A correspondent, E. P. W., says that he was informed by a practical mechanic, that having made a spatula, or pallet knife, such as is used by artists, and tempered it to the blue, or spring temper, he ground and polished it, when it became as soft as before tempered. Considering it worthless, he laid it one side for a time, but one day he held it over the fire, in thoughtlessness, until it was blued, when he found it had regained its original elasticity.

"The fact may be new to some of our readers, although we were practically acquainted for years with this quality of steel, at least of steel of some grades. We believe, however, that cast-steel, generally, when brought to the blue temper, loses some of its elasticity if the blue is removed from the surface. Why, we do not profess to determine, but the experience of many workers in steel will confirm our own."—(*Ibid.*)

Singular Quality in Steel.—In relation to this subject, another correspondent of the *Sci. Amer.* writes: "During the war I was engaged in the manufacture of cavalry sabres for government. In the severe tests to which every blade was subjected, some of them would be found too soft; these I would heat to a blue, and let them cool off, and they would nearly all regain their elasticity, the same as they were before they were polished, but in polishing about one-fourth of them would again lose their elasticity. By experimenting I found that when they first came from the fire after being blued, or 'stiffened' as we called it, to dip them into a solution of sulphuric acid and water, about six parts of water and one of acid, would remove the bluing; and then as soon as they came out of the acid dip them into strong lime-water, which would destroy the acid, and prevent the blades from rusting, when, if wiped off, they would retain their elasticity. This seems to show that it was not removing the bluing that caused them to lose their elasticity, but what was polished off of the outer surface of the steel. Circular saws or any other tools that are too soft may be stiffened in the same manner. I tried to stiffen blades in this way before they had been hardened and tempered, but the process had no effect whatever. Having never tested the bluing process on the cutting quality of steel, I am unable to state the facts, but presume it will improve a tool that is too soft in the same proportion that it will improve its elasticity."

"*Moulds for Casting Iron, Steel, etc.*—Mr. Frederick Tachsel, analytical chemist, and Mr Wm. Hall, brass founder, of Manchester, England, have patented certain improvements made by them in moulding for casting steel, iron, and other metals. According to the usual process of moulding for casting, it is well known that sand is employed which is more or less silicious, the silica of which, when submitted to the melting temperature of certain metals, becomes fused and combines with said metal. This invention consists in substituting for the aforesaid sand, a material which does not substantially contain free silica, lime, or other material which will fuse at the melting temperature of the metal to be cast. With this view, materials with an aluminous base, having been previously reduced to a state of powder, are employed in the place of

the usual sand, and after the ordinary manner of moulding. As illustrative of the invention, coal shale or fire-clay, ground, when dry, to a powder, may be used as above described."—(*Railway Times* and *Sci. Amer.*)

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"*Fire-Proof Gloves.*—At a recent meeting of the Polytechnic Institute a glove of Hungarian make was exhibited. It is of asbestos, which the maker professed is adapted to enable an assayer to hold a heated crucible, but which the exhibitor had not tested. The cost was twenty dollars per pair."—(*American Journal of Mining* and *Chem. News.*)

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"*A Test for gilt articles*, to distinguish them from those which are simply made of a gold-colored bronze, is announced by Weber. It consists in the application of bichloride (the common chloride) of copper in solution, which makes a brown stain on other articles, but does not affect those which are gilt. This statement I have verified with articles known to be gilt, and with several varieties of gold-colored alloys."—(Prof. Morton, *Franklin Inst. Jour.*)

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To save Oil.—"Put the wick into the lamp, and fill the latter about half full with coarse salt, and then put in about one inch of oil, and it will be found that a great saving will be the result. The salt wastes gradually away during the burning, and must, therefore, be renewed from time to time. The light is purer and more brilliant than without the salt, and the wick requires no snuffing."—(*Journal Applied Chemistry.*)

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"*Cement to fasten Iron in Stone.*—A German professor has found out a cement for fastening iron in stone, which in forty-eight hours becomes nearly as hard as the stone itself. This consists of six parts of Portland cement, one part nicely powdered lime, burnt, but not slacked, two parts of sand, and one part of slacked lime. This, when well mixed and reduced to one mass of cement with the necessary quantity of water, is put in the crevices or openings of the stone and the iron, both being previously damped, and after forty-eight hours the iron will be found thoroughly and lastingly fastened in the stone."—(*Ibid.*)

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"*Putty for Metal.*—For a temporary stoppage of holes in vessels of metal, a good putty may be made of starch and a solution of chloride of zinc. The putty soon becomes hardened and will last for many months."—(*Ibid.*)

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"*Putty for Glass, Porcelain, or Metal.*—Take one part of wax, and melt it in an iron vessel, add two parts of clean gutta-percha, cut into thin pieces, stir it well until it has united with the wax, then add three more parts of sealing-wax. This must again be thoroughly stirred till all has become one mass, which is poured out on a wet stone, where it is kneaded. The application must be made while it is in a warm state."—(*Ibid.*)

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"*Burnishing Power.*—A burnishing powder in use in Belgium, is composed of one-half pound of fine chalk, three ounces of pipe-clay, two ounces of white-lead, three-fourths of an ounce of carbonate of magnesia, and as much of jewelers' rouge."—(*Ibid.*)

THE

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ORIGINAL COMMUNICATIONS.

SENSITIVE DENTINE.

BY DR. T. BURGH, NEW YORK.

Read before the Brooklyn Dental Association.

This unpleasant condition of the teeth is to the dentist a phenomenon of surpassing interest. In investigating its cause, he finds a field of unlimited research presented before him; while in pursuing his subject to the limits where others have been compelled to halt, he is surprised to find the doubt and obscurity in which it is involved. In his office practice, its treatment is of vast importance, if it will lighten his labors or relieve his patient of the suffering accompanying them.

The study of the cause of sensitive dentine is specially interesting, as it may enable us to intelligently treat it. With this object in view, it is to be regretted that so little is known upon the subject; for, to the investigator, it must soon be apparent that the opinions upon record are more the result of speculation than demonstration. This is unfortunate, but inevitable, for, in my judgment, it is as impossible to determine with certainty the cause of this condition as it is to demonstrate a thousand other operations of the natural world. It lies hidden in the unexplored arcana of the human system—the undefined and incomprehensible operation of both physiology and pathology.

The physiologist, in accounting for it, attributes it to the disturbance of nerve filaments, which he asserts radiate from the pulp into the tubuli of the tooth, or to the conduction of the shock of the instrument to the pulp; while the pathologist attributes it to local chemical action, and a pathological condition of the general system. In my opinion, the truth lies between the two; that sensation is a normal attribute of the teeth,

heightened by local chemical action, and a general pathological condition. If this hypothesis is correct, the question naturally arises, what is the physiological arrangement by which sensation is imparted to dentine? (I presume that no pathological question will here arise, as I do not believe that any one is prepared to dispute that the sensitiveness of dentine is exalted by local chemical action and a general pathological condition.)

In endeavoring to answer this question, physiologists have advanced no more unfounded theory than that of the presence of nerve fibrils in the dentinal tubuli. Of this theory, Mr. Tomes is the author. He asserts "that nothing is more easy than to demonstrate the existence of the dentinal fibrils in any tooth that has been recently extracted." Although the labors of this eminent dentist have been of great value to the profession, and his authority upon dental physiology must be acknowledged to be great, yet it is certain that his demonstration is not conclusive. It seems that this hypothesis, which once extensively prevailed, has had no other authority than the assertion of this author. I think it highly injudicious, in a matter of such importance, to accept for our guidance a theory which has no other foundation than the assertion of one man, however eminent. If theory is to direct treatment, how important it is that theory should be correct!

Dr. McQuillen, in a masterly Report on Dental Physiology to the American Dental Association, after detailing certain experiments which he had made to find these dentinal fibrils, says: "Speaking for myself, I can truly say that, after giving the subject the most careful attention, I am unable to support the position." And while he does not deny that Mr. Tomes saw fibres such as he described, he attributes them to coagulated fibrine of the liquor sanguinis present in the dentinal tubuli.

However this may be, whether Mr. Tomes' fibres are indeed nerve filaments, or but coagulated fibrine, or, indeed, if there be any fibres at all, the whole matter is too indefinite to be accepted as a theory by the dental profession. We must look elsewhere for the cause of sensation in dentine.

This theory, then, falling for want of support, we must, of necessity, fall back upon the supposition that dentine is the conductor of impressions to the pulp. This I believe to be the physiological condition to which sensitive dentine is in a great measure attributable. But I cannot assent to Dr. McQuillen's position, when he says that he "is inclined to believe that sensitive dentine, so called, is mainly and generally a physiological phenomenon." I believe it to be the reverse—mainly and generally a pathological phenomenon. There are so many indications in proof of this, which will readily occur to the minds of all, that I need not consume time to present them. It may seem to be of little consequence, which it is, in the face of the stubborn fact with which we have to con-

tend daily. But it is a matter of great importance in view of the treatment to which it is to be subject. If it is due mainly to physiology, there is no use in pathological treatment. Can we improve on physiology? Can we produce better than a healthy condition? All that we can do is to get rid of that which is abnormal, and, after exhausting all our skill in systemic and local treatment, we still have the bulk of it left. But if it is a pathological phenomenon, it is amenable to treatment, and all that we have to do is to discover what that treatment is. To successfully administer it of course requires in the operator a scientific medical education. He should be prepared to meet the indications of each case, both locally and constitutionally. There is no question about this. The intelligent practitioner of dentistry sees with pain each day the unsupplied demand for higher medical attainment in the profession. He will never succeed in treating this disease until he has acquired this knowledge. To it he must and will advance. The public judgment would alone demand it; and if it is clamorous, it also is indulgent, for it accords to the intelligent practitioner a support that is unsurpassed by that of any other profession. From this practical aid he must advance. It is not in the nature of things that it should be otherwise. We think ourselves much ahead of the past. We look back upon it in every respect with amazement, and are justly proud of the vast and widening chasm yawning between it and us. But I predict the time is to come when the profession will be so much further in advance of us than we are of the past that the imagination cannot conceive of it. But the glory of that future hour lies through years of toil and struggle. In no way can it be better manifested than by a perfect control of sensitive dentine. A contributor to the Transactions of the American Dental Association says that a different treatment of sensitive dentine is one of the demands of the age. To your books, O Philosopher! To your lectures, your dissecting-room, and, above all, to your own patient original investigations! By these means and these only will science accord to you a different treatment of sensitive dentine. In the mean time we will do the best we can with what poor remedies we have. What are they?

If our knowledge of the cause of sensitive dentine is confused and indefinite, our treatment is but little better. One recommends this remedy and another that, and another denounces all. One says that creosote is the best remedy, and another that creosote only increases the irritation. One lauds the operation of arsenic, and another is loud in its denunciation. One recommends it as specially beneficial in certain cases, and another says it should never be used in just such cases. One relies upon sharp excavators, and another sees no virtue in them. One suggests an alkaline systemic treatment, and another an acid systemic treatment. Confusion reigns supreme, because confusion prevails in regard to causes. To bring order out of this confusion, to erect a standard which shall be

respected as authority, is the labor of the present hour. The past cannot assist us. The books are almost silent upon the subject, and what little they have to say only makes confusion worse confounded. Harris directs the use of arsenic, and refers to no other remedy. Tomes recommends camphorated spirits of wine. "Tannin," he says, "mixed with a solution of gutta-percha and chloroform into a thick paste, will, if introduced into the cavity, in the course of a few days reduce the sensibility sufficiently to allow the operation to be performed." But if the value of the above suggestions is to be judged of by the following assertion, their value is very questionable. "In fact," says he, "any form of temporary filling, if introduced with sufficient care to exclude the saliva, will soon be followed by a subsidence of the sensibility of the tissue." I have removed fillings that were not temporary, and found the tissue so exquisitely sensitive that it was impossible to excavate. Besides, a query arises here. If, as Mr. Tomes asserts, the sensitiveness of dentine arises from the presence of nerve filaments, how does he account for the subsidence of the sensibility merely by the exclusion, for a short time, of the saliva? In the absence of Mr. Tomes, I wish some one would answer this question. Mr. Tomes' formulæ may do for the country in which he practices, but for this latitude they are notoriously inefficient. And here I would remark, that I think climate exercises some influence on this disease. I have not observed very clearly, but I think the more southern the climate, the more marked is this disease. It acts like any other debilitating cause.

The effect of the confusion to which I have referred is, that the majority of operators seldom resort to any treatment at all. The uncertainty which of the remedies will effect the cure, and the consequent loss of time involved in changing them, deter most operators from a systematic course of treatment. They cannot afford to lose time in unsuccessful treatment, and the patient, rather than pay for its loss, generally would prefer to suffer a little pain. But this is so great at times as to be absolutely unendurable, and some treatment must be resorted to. This treatment is altogether local. Constitutional treatment is sometimes talked of, but I know of no one who habitually practices it. As for myself, I seldom resort to any treatment whatever. If I can excavate and fill at the first sitting, I do so; but if the pain is intense, I resort to local treatment, which is sometimes successful and sometimes not. I often resort to treatment when I *could* proceed without; but the patient makes so many manifestations of pain, that I consider it my duty to attempt some relief. My guide is not what the patient is willing to endure; some think it their duty to endure everything, and others have not the fortitude to endure anything. I do not yield to the protestations of the latter class; neither do I impose upon the good-nature of the former. I try to preserve an even way, and to govern myself by the indications of each case—the silent indications as well as the noisy ones. The remedy

which I generally use is creosote and tannic acid, applied on a pledget of cotton, under a gutta-percha filling, and allowed to remain a few days. The creosote should not be used in excess, the cotton should be but partially moistened with it, and then dipped in the tannin and applied to the cavity; the gutta-percha should then be applied over it, without much pressure, so as not to press the creosote out. If the creosote is used in excess, or if it is pressed out, the object is defeated; for it gets between the filling and the walls of the cavity, preventing contact, allowing the escape of the creosote and the ingress of the saliva, besides imposing upon the patient a disagreeable taste. This remedy often works very encouragingly, indeed. If, after the use of this, the sensibility is not at all diminished, I resort to arsenic. My experience with this powerful remedy is exceedingly limited, and I never use it but as a last resort, and with regret. Chloride of zinc I have never used. It was once applied to a tooth of mine, and it made it ache so that I preferred to have the tooth excavated without. It was the worst toothache I ever had, and, in fact, the only one of any account. For this reason, and its known uncertainty, I have never used it. One writer, in referring to this remedy, says: "This will produce various sensations. In some teeth a slight warmth of feeling will be experienced, while in others a considerable pain will be felt; this will last but a few moments, when the cavity can be shaped at pleasure." Here, then, is a specific. "The cavity can be shaped at pleasure." What dentist who hears those magic words can resist conversion? No wonder he previously says, "the treatment of sensitive dentine is not very complicated." I have little confidence in transient remedies, *i.e.* applied and removed while the patient is in the chair. Pathological conditions are not so easily altered. It takes time for the remedy to penetrate the dentine. I have though occasionally found them beneficial. On one occasion I introduced a little dry carbonate of soda, as recommended by Dr. A. C. Hawes, and it enabled me to excavate the cavity. At first it ached considerably, but this passed off, and I allowed it to remain for fifteen minutes; at the end of this time I excavated with comparative ease. The next time I tried it, it afforded no relief whatever, and I never tried it again. I was very much pleased the other day by the operation of a little chloroform, as recommended by several gentlemen of this Association. (See DENTAL COSMOS for February, 1864.) While excavating a tooth for a lady, I worked until her tears attested the pain she suffered. It was decidedly inconvenient to put the case off; because, in the first place, she would leave town the next day; in the second place, the cavity was between two incisors, which had been separated by rubber, and I would rather not let them go together again, or keep them long apart; in the third place, the cavity was so shallow, it would be almost impossible to retain the medicine there and exclude the saliva. Treatment of any kind, except arsenical, was

decidedly unpromising, and time was wanting. I put her under the influence of chloroform, which took about two minutes, and with a few turns of a sharp bur the excavation was complete; the whole operation did not take over four minutes. She was much pleased, and so was I. This is the only instance in which I have used this remedy; but I think it will not be the last. Of course the class of cavities where an anæsthetic would be available are limited. They must be so situated as to be easily approachable, and but little excavation needed. It is especially applicable to those cavities in the front teeth, which only need a little shaping, where good hard cuts, right at the juncture of the enamel and dentine, are often required. However, it may be found applicable to a larger number of cavities. Its use in the different manners which have been suggested before this body is eminently worthy of attention.

Of all the remedies mentioned above, but one is a specific, viz.: arsenic. That can be relied upon with absolute certainty. But if I have refrained from recommending anything, it is this material. Its general and indiscriminate use is, in my judgment, to be deprecated. It is dangerous, treacherous, and in its effects upon the tooth the worst possible remedy. In fact it is no remedy at all. Such a word applied to arsenic is a misnomer. It is a *destroyer*. I never use it but upon the principle of giving my patient the least of evils. If it is a greater evil to endure the pain than to risk the life of the tooth by the application of arsenic, I apply it. This alternative will frequently present itself to the practitioner, and is, in my judgment, sufficient justification for its use. But nothing short of this will justify it. The practice of some operators in using it for the slightest cause, is absolutely without defense. Let us see what will be the effect if applied to the tooth of a young person. That tooth is in an imperfectly calcified condition, inducing great permeability by the arsenic, and increasing the danger of the destruction of the pulp. But let us suppose that the arsenic does not penetrate to the pulp, and that organ is safe. As far as the arsenic has penetrated, the vitality is destroyed. Nutrition departs with sensation, and every other physiological function, never to return. That part of the tooth can never partake of the growth and consolidation of the rest of it, as it shares in the general physiological advancement. The consequence is, that it will never recover from the pathological condition, which was the predisposing cause of decay. If it yielded before, it will, sooner or later, yield again to the disintegrating, local, exciting causes; and the filling inserted may be undermined, and drop out, or decay go on to the nerve unsuspected. If arsenic will do no other injury, it will do this, and this should be sufficient to deter from its general use.

I am well aware that, in discountenancing the use of this material, I am treading upon debatable ground, that has borne the shock of many

a hard campaign, and that there are found in its defense some veterans of the profession, and many younger enthusiastic ones. At this array I can only gaze, and wonder that a material of such known mischievous properties should receive such distinguished advocacy.

There is a certain gentleman who took your speaker to task for defending a certain material of great benefit to the profession and the public, known as amalgam, who probably never dreams of inconsistency, when he proclaims the freest use in the teeth of the deadliest poison, simply because they are a little sensitive. He thought it a serious matter for a young man to defend the use of a material which, inserted in a carious tooth, will probably be a lasting benefit, and himself advocates the introduction of a material which will probably be a lasting injury, and may possibly be a serious one. I know of no two positions ever taken so directly opposed as these the gentleman has taken. I hope he can reconcile them in his own mind. As for me, I would rather defend amalgam than arsenic. There is much that might be said in regard to this material—the manner of using it, the dangers arising from its use, the mischief it has been known to do, etc.,—but as this has all been discussed in our meetings repeatedly, I will refer the intelligent practitioner to those discussions, to the dental journals, to books on dentistry, and to his own cautious experience.

Mr. President, I have thus attempted to respond to the appointment of myself, by this Association, to write a paper upon the subject of sensitive dentine. I will assure you it is but a sense of duty which has compelled me to an exhibition of qualifications inadequate to the task. If, however, I am incompetent to the post assigned me, I suppose it is justly chargeable to my own neglect, and if, in anything I have enunciated, I have incurred your disapprobation, I hope you will mingle justice with mercy, and deal generously with me once more.

DENTO-NEURALGIA.

Read before the New York Society of Dental Surgeons.

BY A. C. CASTLE, M.D., NEW YORK.

NEURALGIA or nervous pain is not only a symptom of almost all acute and most chronic diseases, but also a distinct affection of the nerves themselves. To this latter, the term *Neuralgia* is applied. It may have its seat in any of the nerves of common sensation, and in some instances affects those of *organic* life. Neuralgia may arise from many causes; sometimes no cause can be discovered during life or after death; in which case the disease is attributed to a change in the condition of the nerve itself. In other instances it is the consequence of a debilitated state of the system and follows prolonged lactation, long-continued and excessive

discharges or exhaustion from loss of blood. It also occurs in anæmia, etc. I need not occupy your time with the numerous details of the various classifications. The neuralgia to which I call your attention is *dento-neuralgia*, or those nervous pains experienced in remote parts of the body; in the ear, temples, scalp, the muscles of the neck, and intercostal muscles; in the shoulders, arms, fingers, chest, heart, liver, womb, back, loins, calves of the legs, and toes: superinduced by an irritable condition of the dental system.

Of the many divisions into which the general pathology, etiology, etc. of the organs of the animal system have been divided, none have met with so little attention or investigation as the special pathology of the nerves of the dental system. It has been a great misfortune to the dental profession that these dento-neuralgic affections in their connection with medical dentistry do not pay the dentist as well as his manipulations for plugging teeth and making substitutes. Hence, with a few exceptions, the general dental practitioner finds no charms in the study of dento-medical philosophy, so necessary to the accomplished dentist. He chiefly expends his erudition in solving the problem, "which is the most aristocratic, which takes precedence—the plugging decayed teeth with gold, or making substitutes?" As the dental profession, comprehensively, knows little or nothing of dento-neuralgic disease, it, of course, receives the go-by, and is left to be treated by the family physician. The treatment indicated has therefore generally been *empirical:* as has been the diagnosis, implicating parts as being idiopathically, which have been merely symptomatically and sympathetically affected.

The ever-recurring attempt of offering a pseudo-principle—with here and there a glimmer of an idea of a remote and exciting cause without a fact to demonstrate or explain the theory—has been all that has ever been afforded to medical and dental science to enlighten and elucidate the real nature of the lesions exciting the various complex characteristic dento-neuralgic derangements implicating *sympathetically* various regions of the body. It is true that many distinguished medical men have zealously employed their knowledge in the investigation of neuralgic phenomena; but, to this period, so far from affording any insight for our government in their treatment, or throwing any light upon this important and interesting subject, their efforts to elucidate the causes of neuralgic disease have rather tended to render them still more obscure; thus adding to their ignorance of phthisis, rheumatism, gout, etc., an additional opprobrium upon medical science. In vain I have consulted medical, surgical, and medico-dental literature upon the subject of dento-neuralgic affections. Professor Harris, in his "Dictionary of Dental Science," after all *his* research, only furnishes the definitions of writers on *odontalgia.* Mr. Thomas Bell, of English celebrity, says: "It not unfrequently happens that parts remote become the apparent seat of pain from the *exposure*

of the nerve of a tooth." Here you will observe that Bell refers only to exposed nerves. He does not appear to suppose or to think that dento-neuralgic sympathies are produced otherwise. The eminent author, Dr. Good, says: "Neuralgia often is an idiopathic affection dependent upon a peculiar irritation from a cause we cannot trace. It is more frequently a disease of sympathy produced by pregnancy, rheumatism, or acrimony of the stomach." The distinguished Dr. Wood speaks of neuralgic affections from the teeth, only where the affection is marked by pain in the teeth. Professor Bond, in his Treatise on Dental Surgery, says: "It is not certain whether the seat of the disease is in the neurilemma or in the nervous pulp. It will at once be perceived that the dentist must be called upon to discriminate between this disease and ordinary toothache; and unless he be properly informed upon these subjects, he may add to the terrible sufferings of the too confiding patient. In most cases the neuralgia of the jaw is at first mistaken for toothache, and ignorant dentists too frequently have extracted tooth after tooth; and have at last relinquished the patient to his aggravated sufferings." The professor then says: "From toothache depending upon exposed nerves, neuralgia may be diagnosed by the" (self) "evident centralization of the pain in a certain tooth; by the aggravation of it *when the tooth in fault is touched*, and by the positive evidence of a cavity in a tooth with an exquisitely sensitive pulp exposed." Where such a simple odontalgic condition exists, it certainly needs no ghost to instruct us. Now, I have met with very many teeth, with pulps exquisitely tender *to the touch*, exposed to all external agents, yet no pain whatever was experienced *in* these teeth; but sympathetic pains existed elsewhere. This, especially, refers to the "wisdom teeth," in which, in nine cases out of ten, if the nerve is exposed and exquisitely tender to the touch, the pain is experienced in the teeth, jaws, and face anterior to the *dens sapientiæ*, with neuralgic affections in the ear and temples, with nervous headaches, muscular neuralgic pains in the scalp, neck, and various parts of the body. It is diseased wisdom teeth which cause "extraction of tooth after tooth," from the simple fact that the pain almost invariably is experienced in the teeth anterior to the wisdom teeth.

The erudition of scientific nonsense upon the subject of neuralgia may be found on page 141 of the *American Journal of Dental Science*, published A.D. 1841. J. E. Snodgrass, M.D., in a communication to that journal, relates the "odontalgic" cause of his father's death, "produced by neuralgic-phrenitis, or inflammation of the brain, superinduced by a general odontalgic affection, in which a number of teeth participated." The symptoms were of the severest nature, lockjaw, drumming in the ears, earache, swimming in the head, deep-seated benumbed pains, delirium. "With these complications of symptoms, not usually attending phrenitis," observes the doctor, "for several hours he sunk into a

somewhat soporific state characterized by what was afterward recognized as a lethargic or comatose state. If," says the doctor, "we had any doubts on this score, the nervous connections between these parts need merely be alluded to in order to render the *inference clear*, that phrenitis and the *sudden* death (of his father) were the results of a simple (?) odontalgia." The doctor concludes: "The nerves, distributed to the teeth and ear, have a common origin in branches of the fifth and seventh pairs of nerves, while the immediate nervous relation of the auditory apparatus with the cerebral mass, and its great covering, the *dura mater*, is strikingly apparent."

The following illustrative cases of dento-neuralgic sympathies are on record. The great Dr. Rush mentions a case of "madness occasioned by diseased teeth *which were no ways painful* to the patient, and therefore offered no diagnostic mark that the teeth were the proximate and exciting cause of the mania affecting the patient." Dr. Rush also records "*a supposed case of hip-joint* disease, complicated with *rheumatic* affections, being *immediately* removed after the extraction of a tooth, which proved to be the exciting cause of the sympathetic affection of the hip-joint and adjacent parts."

The *London Lancet* records a case of neuralgia of the womb, immediately disappearing after the extraction of a diseased tooth. The distinguished dentist, Kœcker, of Philadelphia, relates a case of *epilepsy*, at once disappearing after the extraction of some diseased teeth.

In a future paper I shall illustrate, with maps of nerves, numerous interesting cases which have presented themselves to my care, of neuralgic derangements of different regions of the body, whose proximate cause was solely the disordered condition of the dental system.

It is with the view, therefore, of adding to the *not* very extensive stock of information, all that I have been able to collate on this subject, that I was induced to offer the subject of dento-neuralgic phenomena for the consideration of this society this evening, hoping that the practical observations of its members would furnish some new data that would add profitably to dental science: with the view also of repeating my remarks made in a former paper. "That when the art and science of dentistry are practiced (less as a *trade* for making money) with better professional knowledge, *then* the professional character of the dentist must compel the medical faculty to acknowledge dentistry as a specialty in the healing art." I now repeat the sentiments of that paper with the additional remarks, that to dental students is reserved the honor of elucidating many affections hitherto considered idiopathic, neuralgic, and rheumatic, but which are traceable to derangements of the dental system, as to them was reserved the honor of introducing chloroform, ether, and ether-spray for surgical operations.

Few afflictions affecting the human family present themselves to the

medical practitioner that occasion so many vexations, or produce so many perplexities and mortifications to professional feelings and pride, as does the *unsuccessful treatment* of these painful nervous derangements of the various parts of the body,—known and accepted by the not very precise term of "neuralgic affections." The discussion, to-night, upon this important subject, should be peculiarly interesting to the practicing dentist, who should learn to esteem his duties as something more exalted than mere mechanism. He will discover that they are far more extended than the limits of dental mechanical skill; that, with an ordinary amount of anatomical, physiological, and pathological knowledge, he will hold communion with the physiological mechanism, a part of Nature, great and wonderful as it is beneficent and good. The object, then, of the discussion of this truly interesting and comprehensive subject is to establish data, for the purpose of elucidating and demonstrating the physiological and pathological condition of the *dental* in their relation with other sympathetic nerves.

Nosologists have named neuralgic affections according with the locality of the nerves *supposed* to be the seat of pain: thus, *neuralgia facialis* or *tic douloureux*—the *tic convulsif* of French authors; *neuralgia, pollicis sciatica;* the *ischias nervosum*, or pain in the branches of the great sciatic nerve; and so forth with other nerves.

Thirty years' observation and investigation have enabled me to throw some light in elucidating the proximate cause of many neuralgic affections, demonstrating that a large number are sympathetic and symptomatic of dental derangements; but which nosologists have named in accordance with the region of the body in which the pain is experienced.

I have named these sympathetic neuralgic affections, DENTO-NEURALGIA, predicated upon the proximate cause—the peculiar condition of super or sub-excitement—irritation if you please—of the dental nerves—the fifth pair of nerves—within and upon the bony tissues of the teeth and their maxillary bones and investing periosteum in their anastomosing connection with other sympathetic nerves; a morbid condition of the bony structure of the teeth, whether from original constitutional deficiency, or produced by vitiating gastric acids, or the premature decay of the teeth dependent upon the absence of proper nutrition, or from scrofulous, scorbutic, or syphilitic diathesis, the action of mercury, arsenic, antimony, iron, quinine, iodides, etc.; all of which exert their several peculiar influences upon the dental organs, and hence upon their nerves, causing dento-neuralgic symptoms in the various parts of the body.

It is not my province here to detail the affections of the dental system. But I will mention one or two exciting causes. We find the dental tissues irritated and changed in character from the causes I have already enumerated. Any one of you may observe in many of the teeth you daily extract the animal portion absorbed from the earthy constituents of the

superior portion, or apices of the fangs, leaving them in a semi-transparent condition; the lower portions and necks to the crowns of the teeth remaining opaque and normal in their character. While this change is being produced in the fangs, the alveoli and the dental periosteum become exquisitely sensitive—moderately to cold or warm applications—but intensely acute to the presence of acids, sweetcakes, and confectionery. These are the primary effects of dental derangement and the premonitory symptoms of dento-neuralgic affections. These teeth are often glassy, brittle, breaking readily under the extracting instruments. In many of the transparent fangs of such affected teeth, you will find the *extreme points* or apices *absent* from absorption; impressing the uninitiated dentist with an unfounded idea that he has broken off the apex of the fang in the act of extracting the tooth; the sharp, spiculated points prove the contrary. In the class of teeth whose crowns are worn down and their nerve-chambers filled in by a deposited amber-like dentine, we too often find the maxillary absorbents exercising their baneful influence upon the roots of the altered teeth, with recession of the gums and their alveoli. Medical practitioners, and, alas! dental practitioners too, designate these affections, "scurvy in the gums."

The absence of antagonizing teeth is another exciting cause for dento-neuralgic affections. The lower jaw, finding no resistance, is, by the contraction of the temporal muscles, closed to an unnatural extent toward the superior maxillary, which, acting like an overshut door lacking the resistance of the proper door-post, overstrains its hinges; so the inferior maxillary bone overstrains its joints, affecting the nerve to an extent to superinduce nervous irritability, and hence sympathetic neuralgic paroxysms. The dental system thus affected, presenting no external physical disintegration (decay), exhibits some of the causes of dento-neuralgic affections in contradistinction to *odontalgic pains* portrayed by Professor Bond. Dento-nervous irritation being established in the dental system, which from "the infant muling and puling in the nurse's arms," to "the last scene of all," daily presents to our observation neuralgic, symptomatic, and sympathetic paroxysms. Thus are daily presented to the medical world, the physician, the surgeon, and the dentist, innumerable instances in which each and all may recognize the essential starting-point of a correct diagnosis of many rheums, pains, and convulsions, which, without any apparent exciting cause, experience shows to affect patients from childhood to old age, dependent upon and arising from a source entirely overlooked and even little dreamed of in medical and dental philosophy. It were useless to cite the everlasting number of cases where patients have been subjected, for years, to the most harassing empirical treatment. Narcotics, sedatives, emollients, irritants, stimulants, counter-irritants, moxas, nervines, antispasmodics, sudorifics, phosphates, chalybeates, alkalies, acids,

arsenic, mercury, copper, bismuth, iodine, potassa, quinine. Phlebotomy, cupping and leeching. Alteratives and aperients, cold and warm baths, sulphur-baths and fumigation, sea-bathing, electricity, the surgeon's knife for excision of some innocent, unoffending ganglionic centre. Then homœopathy, hydropathy, spiritualism, polarized clairvoyance, Thompsonianism, nostrums, and laughing gas, have all stepped in and taken their turn; "certain to effect a cure." If the wretched sufferer has had sufficient stamina, or vital force to resist these terrible onslaughts and assaults upon a citadel so frail—so wonderfully and fearfully made,—it has been to sink into hopelessness and despair. Very many of these severe cases I have seen wherein this mystery has not been even thought of by medical men until the tortured patient has been accidentally and suddenly relieved by the dentist's turnkey or forceps.

As I have already observed, it is impossible to enter upon details in a paper designed merely to call your attention to the facts given from my limited experience. I have thrown together these few introductory hints for this evening's discussion, and for the reflection and observation of the dental profession at large. At some future period I shall continue the subject with maps, illustrating and demonstrating the remarks I have advanced.

ANAESTHESIA BY NARCOTIC SPRAY.

BY W. T. SHANNON, BROOKLYN, N. Y.

Ether, chloroform, and nitrous oxide have been used with great good resulting, but they are all more or less dangerous, and exceedingly inconvenient at times. It is not necessary to go into details on this head, as those who have used either or all, *know* such is the fact.

My object in writing this is to speak of the superiority—I say superiority, for in my opinion it far excels any anæsthetic I have ever used—of the new method of producing local anæsthesia, discovered by Dr. Richardson.

I have been using it some five weeks, and, with one exception (when I broke the crown of a tooth, and lost time in getting forceps for the fangs, and securing a good hold thereon, the circulation returning, some pain was felt; had I renewed the application of the rhigolene before removing the fangs, this would have proved to be no exception), I have not met with a single failure when I have applied it.

I have extracted a great many teeth, opened "felons," mammary abscess, etc., without pain, and no bad results from freezing or otherwise.

My mode of manipulating in extracting is to protect with a napkin the soft tissues and teeth adjacent to those to be removed, and direct the spray immediately on the latter, as the dental circulation can be more

speedily reached and checked thus, and the periosteal and dental nerves become more quickly insensible, than by going through the soft tissues and alveolus, avoiding also by this manner, any freezing of the gums.

For the first three to five seconds, the patient will usually complain of a sensation similar to that of taking a mouthful of ice-water on a tender tooth; in eight to ten seconds it gradually disappears, and by ten to fifteen seconds, the tooth has no sensibility whatever. By promptness and skill you may then make a painless extraction. If there is an exposed nerve, cover it with wax before applying the spray.

Another very great benefit I have derived from this agent, is in driving the "wedge" between the necks of the teeth preparatory to filling.

I introduce the wedge gently, just allowing the inner point to clear the gum—apply the spray five seconds to the surrounding parts, and then drive home the wedge without pain to the patient; this, as every dentist who uses the "wedge" knows, will prove a great blessing to our patients, as there is scarcely any part of the operation of filling so painful as driving *home* a wedge that will be of service.

I most emphatically and unequivocally extend my sincere and heartfelt thanks to Dr. Richardson for his useful discovery; and praise and honor him because he *hasn't patented it.*

SURGICAL DEPARTMENT OF THE PHILADELPHIA DENTAL COLLEGE.

Under the charge of Jas. E. Garretson, M.D., D.D.S.

CLINIC REPORT.

BY H. L. GILMOUR.

THE clinic was opened, as advertised, on the first Thursday in September, 1866. The cases presenting are quite numerous and of the most interesting and instructive character. My notes already embrace the following cases: hydrocele, amputations, necrosis, strabismus, hernia, epulic tumors, varix, ulcers, cleft palate, two cases of sebaceous tumors of forehead, abscess of the submaxillary gland, fatty tumor of hand, etc.

This afternoon, October 18, the first case presented was that of a boy six years of age, afflicted with necrosis, involving the right side of the inferior maxilla from the cuspid tooth back to the articulation. The case, Dr. Garretson remarked, was one most doubtful in its issue, the child being much prostrated. Explanations were given of the condition in necrosis, the various causes inducing it, and the manner of its course. Particular stress was laid upon the general inadvisability of anticipating by operation the process of cure effected by the natural loosening of the sequestrum. For the present, prescribe a daily salt bath, the internal use of

ferrated elixir of cinchona, and frequent syringings of the part with medicated water. In a month it was anticipated that the bone would be found exfoliated, when by an operation confined entirely to the inside of the mouth he would remove it. Opportunity was given to the members of the class to recognize the peculiar feel of dead bone by the touch of an instrument, after which a general oversight of the case was intrusted to an advanced student.

Second case. A colored man, aged forty-five; incipient cataract of both eyes. The humors of the eye were explained, and cataract described as being dependent on opacity of the middle lens. The ability of the patient to see better in early evening than at mid-day was explained from the effect of light upon the iris, the opacity being as yet confined more markedly to the centre of the lens.

Third case. Perforation of soft palate from syphilitic ulceration. In this case, Dr. Garretson had previously removed the horizontal plates of both palate bones; ulcers of necrosis were described, and to prevent their unnecessary enlargement, free scarification was recommended. Exhibition internally of the mineral acids was also highly spoken of. The various methods of treatment of openings existing both in the soft and hard palate were also described. This particular patient was wearing a nicely adjusted obturator, and was thus enabled to speak with all ease. Without the cotton, the tone was so nasal as not to be understood.

(To be continued.)

DIFFICULT CAVITIES.

BY WM. H. ATKINSON, M.D., D.D.S., NEW YORK.

PERMIT me to tell you in one short sentence just how to take care of all "difficult cavities," as well as all other operations of head, heart, or hand.

Reduce them to easy, simple cavities and operations!

O! yes; but how is that to be done? By patient, persistent study, make yourself master of the tissues with which you have to deal, in healthy and unhealthy expression. This will enable you to diagnose your case.

Then acquaint yourself with methods and means by which to so prepare the remains of the tooth as to securely hold the gold, also so shaping the margins by bevel as to secure a place for the gold to flange over and mutually support the fragments of tooth, thus making all one. Then proceed to fill solidly the retaining parts, and build carefully and regularly upon this "firm base" until you have reproduced the exact contour of the original tooth, if well formed; or if not, just such shape, size, and length as to secure perfection of fullness inside and out, and length and

form just sufficient to secure the proper occlusion of the golden tooth with its antagonists, and then all that remains is to finish to your and the patient's taste.

Having taken all these steps in regular succession, and faithfully executed each, you will have rendered this difficult and complicated matter, one simple, feasible, and easy of execution, to yourself and to the patient, who will ever after be your fast friend and admirer, if a spark of honor or good sense has residence in his nature.

Says some one, "Yes! yes! this is all very good 'talk;' but it does not show us just how to do that which seems so easy for you to tell!" Well, if words alone fail to "illuminate" your minds up to the point of clear and definite perception, just drop into the office of any poor publican-progressive who is not afraid nor ashamed to help even a poor "gutter dentist," and ask him if it will be agreeable to him to have you present, when he puts through his next "difficult" case. And ten to one he will say, "I have one now in process; please wait a moment till I get permission for you to be present." In a moment more he comes smilingly into the reception-room, and says, "Come! all right!" And thus pleasantly goes through his work with perfect ease and co-fraternal feeling, asking your advice or suggestion here and there upon this point and that, while you and the patient are so pleasantly entertained by the intelligent, benevolent conversation, that both will be surprised what has become of the time.

If circumstances do not favor so early an opportunity, kindly accept the first you can get, at this or any other office or clinic where such things are done, and be assured the number of insurmountable cases will rapidly grow beautifully less to those who are willing to work with a will.

ANAESTHETIC SPRAY PRODUCER.

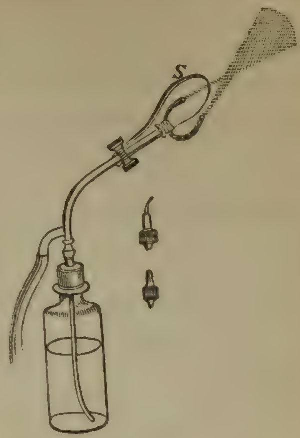
BY JAS. E. WELCH, D.D.S., BRIGHTON, ENGLAND.

(Correspondence of the *British Journal of Dental Science.*)

Sir,—In the May number of your journal I suggested, as an improvement and addition to Dr. Richardson's spray producer, a bent wire to be attached to the delivery tube. Upon applying to Messrs. Krohne and Sessmann to make it, I learned that it could not be added to the instrument then in use; and as it was necessary to have a new one constructed, I gave the matter more consideration, and had an instrument made with which I can now easily and successfully perform operations in the mouth without pain.

Instead of a bent wire, I had a piece of metal, of the size and shape of a mouth reflector, attached to the delivery tube. It is made to turn to the right or left, and also slide up and down, being firmly retained in

any position required, by a screw. This enables the operator to distend the lips or cheek without any assistance from another person; it also keeps the tongue out of the way when used for the lower jaw; and by wrapping a piece of lint round it, the saliva is absorbed, and that difficulty got over. The delivery tubes are made thinner and bent at a different angle, so that the ether does not condense and accumulate on the lips of them so much; and the two sprays meet at a distance of one inch and an eighth from the orifices of the jets. This arrangement obtains the greatest amount of cold in the shortest time. The delivery tube itself is made stouter, so that the jets fit firmer and closer. The orifice of the lower tube, which dips into the ether, is as small as the copper wire sent out with the instruments. This is very important, as it does not reduce the volume of the spray, but makes it so perfect that the thermometer may be brought down as far in five seconds as the other with the usual aperture took fifteen to, and not half so much ether is consumed.



I received the instrument, constructed as explained, on the thirteenth of June, and have been using it daily since. I have removed at one sitting seven stumps from the lower jaw, and as many as nine from the upper jaw, from nervous patients.

The results of my experiments may be summed up thus: Three jets are required, or (what would be much better) three instruments made with fixed jets.

1. For the upper centrals, laterals, canines, and stumps, a single straight jet.
2. For the lower centrals, laterals, canines, and stumps, a single jet bent.
3. For the upper and lower molars and bicuspids, a double jet.

FLAT AND CONTOUR PLUGS.

BY J. S. LATIMER, D.D.S., NEW YORK.

UNTIL the advent of crystal gold and the employment of the adhesive property of foil, nearly all plugs were left even with the walls—mere plane surfaces. This was necessitated by the difficulty—often quite insurmountable—met with in attempting to fill cavities compounded of more than one surface, and hence called compound cavities. Accord-

ingly we got access to the approximal cavities of molars and bicuspids by slabbing off their approximo-grinding angles and filled them with large soft pellets, cylinders, or ropes. The aperture between the teeth was V-shaped, and, as a consequence, the patient subsequently experienced great annoyance from accumulations of food wedged between the teeth and crowding against the gum. Frequently the toothpick had to be employed several times during a dinner for the removal of such accumulations.

Besides the great difficulty of operating in such spaces, other objections were urged against the practice. It was found that the patient, in addition to having the symmetry of his teeth destroyed, lost a large proportion of their masticating surface. Furthermore, by this process, some portion of the dentine was generally left exposed, and that, too, where it was least desired—next the borders of the filling. All these considerations conspired to make us appreciate the method of welding our plugs into compact masses which has now become the common method; for by this means we are enabled to fill compound cavities with the same readiness with which we fill simple ones, and we can restore the angles with a hard, tough plug, capable of enduring mastication for many years. I confess that I formerly restored the contour of anterior teeth with great reluctance, in all cases which could display a considerable quantity of gold, and even now, I let my patients elect whether they will have gold or artificial crown, when the gold would be *very* conspicuous.

But a further restoration of contour has lately come in vogue through the recommendation and influence, I believe, of our worthy co-laborer, Dr. Atkinson, from whom we have had so many good things: I refer to the restoration of the cusps and indentations of the grinding surfaces of molars and bicuspids. The wisdom of this appeals to our common sense.

The miller cannot grind with smooth stones, so he roughens their surfaces. Providence gave the mastodon and the elephant their peculiar grinders for this purpose, and men grinders with cusps as hard as granite.

Is it not wise, then, to accept the lesson and restore the contour of the teeth we fill? But, says an advocate of the flat fillings, don't you know that gold is of an ugly color? and are you not aware that patients won't pay for fancy operations?

Candor compels me to admit that the color of gold presents a decided contrast to that of the tooth, and one not at all desirable, but I question whether the disfigurement is greater when the contour is restored with gold than when but a fraction of the tooth is presented for criticism.

It is to be hoped, however, that ultimately we shall be supplied with a plastic material resembling the tooth in color and yet sufficiently indestructible by the fluids of the mouth and the attrition consequent on mastication, to successfully rival gold.

With molars and bicuspids, the objection of color is of no moment; while, in the case of the anterior teeth, the advantage to the voice of restored contour, is of compensating advantage.

In considering the relative merits of the two methods of filling, the question of price is but incidentally relevant, for the question is not which is the better to be exclusively used; but, the merits and demerits of both considered, which has the greater intrinsic merit?

With reference to price and the general application to all classes of society, it is safe to say that not merely the preservation of the *life* of a tooth is desired, but we are bound, as faithful surgeons and artists, to preserve the teeth in all their utility.

It can hardly be said that masticators and incisors have their utility completely restored when portions of their grinding and incising surfaces are gone, and when the patient goes away with fragments of incisors, between which the breath is whistled whenever speech is attempted.

Why, patients tell me they want the best service I can render them, for they have learned that it is economy to pay for the *best service* rather than that which *costs* least.

It seems to me to comport better with our pretensions as a learned and beneficent profession, to give to *all* our patients the benefit of the excellent rule, "WHATEVER IS WORTH DOING AT ALL IS WORTH DOING WELL."

Would a surgeon be doing his duty to a poor patient by merely preserving the vitality of an arm, that greater painstaking might not only preserve, but utilize?

If the men who work for the poor prey upon their ignorance and give but partial benefit because of the smallness of the fee, may the good Lord forgive them and open their eyes to see their *whole* duty and their true interest.

One objection raised against the restoration of the approximo-grinding angles of molars and bicuspids is well worthy of our consideration. It is this: the narrowness of the space between the teeth rendered caries possible in the first instance; and now, if we restore the original contour, we return the original defect and may expect a recurrence of the disease. This point is well taken, but there is a remedy.

However the teeth may be filled, the dangers of the continuance of the causes producing decay must not be overlooked. Not only are the filled teeth liable to caries, but those that have not been filled require that the original cause shall be removed or its effect neutralized by local treatment.

The man who fills the teeth never so elegantly and fails to impress upon his patients the necessity of absolute cleanliness for their preservation, comes short of his duty and his privilege.

The great Master Dentist might have shaped our teeth so that V-shaped apertures would appear between them; but he did not. We were not made to be slovens.

By getting access to the approximal cavities in molars and bicuspids through what might be styled a dove-tailed mortice cut through the centre of the approximo-grinding angle, the operator is enabled to see and get access to every part of his cavity, without which it is scarcely possible to be certain that the excavation and the introduction of the gold have been such as to insure the subsequent safety of the tooth.

That occasional failures will be made by *any* process, I am fully aware; that imperfectly-anchored contour plugs will be liable to dislodgment, has been frequently proved to me; but an experience of more than five years of the contour work, following five years of the flat method, has compelled me to dissent from the judgment of those who style the modern method "fancy" and "filigree" work.

MYCROSCOPY OF THE TEETH.

BY S. P. CUTLER, M.D., D.D.S., HOLLY SPRINGS, MISS.

(Continued from page 183.)

If the branching tubuli, after entering the membrane, subdivide or send off lateral branches into the substance of the membrane, I have not been able to discover them; still such may be the case to a certain extent. On thinning down a specimen until this membranous body disappears, the terminal branches of the tubuli are readily seen, or a large proportion of them passing directly through the membrane into the substance of the enamel for a short distance, then terminating abruptly; generally the portion entering the enamel is in a direct line with the branches as they pass through the membrane.

There is no anastomosing of terminal branches discoverable, each extremity being isolated and distinct. In some cases there is a slight enlargement of the branch where it enters the enamel. Some branches penetrate into the enamel farther than others; some scarcely entering it at all, but stopping in the membrane, or simply passing through and there stopping.

These tubuli are all well defined to their ultimate limits, all terminating, as already stated, abruptly. This explains the cause of the extreme sensibility of the enamel in some cases from filing just before reaching the dentine, which every dentist has witnessed. Other cases are not sensitive at all, either in the enamel or dentine, as in cases of very dense teeth in certain temperaments.

It is a fact well known to all experienced dentists, that the most sensitive point of a decayed tooth is just under the enamel, or where this

and the dentine join. This membrane, that forms the union between the enamel and dentine, seems to be the point of greatest sensibility, where the tubuli are most numerous and small. It is a well-known fact that the finer the nerve filament the more sharp and acute is the sensibility or pain from injury or inflammation, and that the larger the nerve the less acute is it to morbid impressions; in other words, the pain is more blunt or obtuse the larger the nerve. I might cite instances, but it is not necessary to my purpose.

Before following this subject farther, I must finish the subject of the tubuli and dentine. I have given minute details of the tubuli of the crowns and necks of teeth; it now remains for me to follow down the fang in connection.

The nerve pulp occupies the entire cavity of the tooth. The cuspidati and incisors generally have one regular continuous cavity or hollow running parallel with the longer axis of the tooth from the middle portion of the crown to near the end of the fang where the dentine and cementum join, corresponding in shape very nearly to the exterior of the tooth, the size of this cavity being in proportion to size of tooth.

The molars and bicuspids differ from the former, especially the molars, as they always have more than one fang. The pulp cavity in these teeth also correspond more or less to the multiple arrangement of their fangs, the pulp cavity occupying the entire central portion of crown and neck, there dividing and passing down, the fangs corresponding to their exterior shape, whether oval, round, or flat. These facts are well known to the profession, and need no farther comment here. The same tubular arrangements will be observed in the fang that has been described in the foregoing treatise with some variations. From the neck of the tooth down some half way of the fang, the same figure is observed; that is, the S shape of the course of the tubuli. As we pass below the middle, this figure changes somewhat in the evenness and regularity until we arrive at the apex of the dentine of the fang, where there is a marked difference.

At the point and a short distance up the fang, there is a simple curve; after leaving the pulp cavity, the course is downward, then curving outward and upward, reaching the cementum without any secondary curving, as heretofore described. This curve at the apex is very considerable and strangely marked, gradually running into the figure already described. At the middle of the fang, as a general rule, the single curve is lost in the compound curve, or the primary and secondary curve, varying somewhat in different teeth, where the one is merged fully into the other. The curves low down in the fang are very acute, just after leaving the nerve cavity, especially in flat fangs. After passing below the middle of the fang, the regularity in the tubuli becomes less distinctly marked in their general course; in other words, their

parallelism from pulp cavity to cementum. In the lower half of the fang great irregularity exists; instead of all of the branches of the tubuli reaching the surface, a large portion of them are lost in the substance of the dentine, stopping short of cementum. Branches in this region are discoverable soon after leaving the cavity, and those branches are exceedingly numerous; but most of them soon lose themselves by coming to a very minute termination. These tubuli taper to a minute or attenuated point. The tubes, where they leave the cavity, are all about the same size from tip of the fang to coronal branches, not differing essentially in size throughout; if there is any difference, the smaller ones are found low down in the fang.

In the lower fang there are zones or spots, where there are very few tubes leaving the cavity, and other spots where they are very thick, and appear almost to touch each other. This same arrangement generally continues some distance from the hollow, so much so that in some specimens there are light and dark regions, the dark showing where the tubes are in close proximity, the light showing where they are sparse. These irregularities are not governed by any regular rule or system apparently. The tubuli low down in the fang, near the cementum, are not apparently as numerous as in the neck and crown, and when a specimen is made very thin, so as to show the tubuli distinct at pulp cavity, they almost entirely disappear; as we approach the surface of the dentine, we may infer from this fact that the greater portion of the tubuli are lost in the dentine before reaching the cementum. Whether or not all the branches of the tubuli that actually reach the cementum terminate in or connect with the lacunæ, I cannot yet determine, though beyond a doubt the greater portion of them do anastomose with the canaliculi.

(To be continued.)

RHIGOLENE FOR PRODUCING LOCAL ANAESTHESIA.

BY W. H. KLOCK, LITTLE FALLS, N. Y.

I HAVE used this article, with the apparatus, for producing local anæsthesia in my practice for the last four months, with considerable success. It needs some experience in causing it to be successful. In the first place, it should not be used on a tooth in which a living nerve is exposed without first protecting the nerve by filling the cavity with some non-conducting material. Asbestos is as good as anything. Having filled the cavity and sealed it with wax, you can throw the spray on the gums around the tooth without producing pain. If this precaution is not observed, it will cause intense pain on all teeth or roots in which the nerve is dead. It can be applied at once, and the teeth removed without any pain to speak of—the patient being conscious, it is natural that there should be some apprehension of pain; and the nervous ones not unfre-

quently cry out as if they suffered pain; but in a few moments they will usually assure you that they are more scared than hurt. One other point I have noticed, and that is, that the attachments of the teeth to their sockets and soft parts are considerably reduced, so that a tooth or root can be much more easily removed—the gums will assume a chalky-white appearance within ten seconds from the time the spray is applied. I usually continue the application from ten to fifteen seconds longer, for the purpose of thoroughly benumbing the tooth and surrounding parts before I extract the tooth. It will be found that within one minute the gums have regained their normal appearance and sensibility; and I have not as yet seen any untoward effects from its use, although I have extracted two hundred or more teeth, and often ten to fifteen in the same mouth, when I was preparing for the insertion of sets of teeth, yet the gums have healed as readily as in cases where it had not been used. I think it well to explain to patients something of the nature of the agent you are using, and to throw the spray on the back of your own hand and then on theirs, for the purpose of letting them know how it feels before commencing on the teeth; and then it should be commenced with a gentle stream at first, gradually increasing until the desired effect is produced. All of the upper teeth may be benumbed or made insensible, and the lower incisors, cuspids, and bicuspids, without the aid of an assistant, by the patient simply pulling the lower lip downward and backward, so as to expose the tooth and gums to be operated on, and in like manner the upper, by pushing the lip upward and backward. The lower molars will often need an assistant, and it is sometimes necessary to close the salivary ducts with spunk, paper, or a napkin, to prevent the too rapid flow of saliva while the gas is being thrown on the gums. I think no dentist who has given this method of producing local anæsthesia a fair trial, will ever do without it.

My patients have so far expressed themselves decidedly in favor of this method, and as I have for many years (seventeen or eighteen at least) administered chloroform and washed ether in my practice, and for the last four years nitrous oxide gas, and usually with very good success, I let them, if there are no unfavorable indications, take their choice, and those who have tried the local anæsthesia, prefer it to any other, for the reason that they believe it unattended with danger, and prefer knowing what is being done. This instrument, the spray producer, may be used with great advantage in obtunding sensitive dentine while the cavity is being dressed out; and it is especially adapted to those cavities that form at the margin of the gums. In many other cases of minor surgery, it can be used with advantage.

A physician in town, called at my office with a patient suffering with a felon on the index finger, requesting me to benumb it previous to lancing, which was done: the finger thoroughly lanced without any pain to speak of.

DENTAL JOTTINGS.

BY HENRY S. CHASE, M.D., D.D.S., IOWA CITY, IA.

Gold Plugs.—A *loose* pellet, of *un*adhesive gold, large enough to fill a cavity, will be found useful in many cases to be introduced *first*, into which small pieces of adhesive gold can be forced, to which others will adhere. This is especially useful in cases where you cannot fix an *adhesive* first pellet in the anchorage. Gold *mixed* in this way will be found *very* desirable by those who will try it in suitable cavities.

Spunk is the best absorbent I know of; but it causes much pain in sensitive teeth by rapidly absorbing the fluids of the tubuli, therefore I do not use it for drying out cavities ; I cut it in strips, and use it under the lips, around teeth, and over the salivary ducts. With it and the new duct compressor, or tongue holder, I can keep the wettest mouth dry as long as desirable.

Early Development of Permanent Teeth.—I have just seen a little girl, only four years old, with all four of the first permanent molars completely erupted and in *position*. She has twenty-four teeth ; the incisors are just being erupted ; she looks *old* in her face.

Dental Syphilis.—A boy, eight years old, is my patient for operations on his teeth, which are poor. The temporary teeth are all decayed, excepting the canines. Sixth-year molars decayed ; incisors erupted, but not in position ; incisors are all badly *notched;* a pretty sure *mate* for hereditary syphilis. This boy has *sores* on both legs, so that he is quite lame.

Men who disobey the laws of God curse their posterity to the third and fourth generation !

A CHEAP SPIRIT BLOWPIPE.

BY E. M. MORRISON, M.D., NOBLESVILLE, IND.

To meet emergencies in the country, we often have to call upon our inventive powers for an expedient, and little things are of great service to us ; hence we cannot despise the day thereof. As I had none but a common blowpipe, and needed to use one frequently, I cut a screw-hole into my vulcanizing boiler just below the rim or collar, and a copper tube, three-fourths of an inch long, was screwed firmly into it, and soldered with soft solder to make it more secure. The tube was also filled with solder, and a hole made through the centre, into which a common brass wood-screw was forced with the screw-driver till the point was even with the inside of the boiler, and the head rested against the end of the tube. This was an effectual security against leakage in vulcanizing. Then, to convert my vulcanizer into a good spirit blowpipe, it was only neces-

sary to remove the screw and attach a rubber tube with one end to this copper tube, and the other to the common blowpipe. It will be seen that this expedient has all the essentials of a spirit blowpipe, and the manner of its operations is so apparent that a description is not necessary. As every dentist has a vulcanizer, this bit of information, small as it is, may be beneficial to some of the members of our profession, and I can assure them that it will be found very convenient, economical, and efficient for general soldering and heating purposes. It would still be better if the tube and screw were made of solid copper or brass. The screw could be removed also to admit the air into the boiler after vulcanizing, in case it should cool too much before opening; but this might be construed to be a remedy for carelessness, an evil which should never exist in a dental office.

PROCEEDINGS OF DENTAL SOCIETIES.

PROCEEDINGS OF THE ODONTOGRAPHIC SOCIETY OF PENNSYLVANIA.

BY THOS. C. STELLWAGEN, D.D.S., A.M.

A MEETING of the Society was held at the PHILADELPHIA DENTAL COLLEGE, Monday evening, December 3, 1866.

The President, Dr. Jas. M. Harris, in the chair.

Wm. Trueman, D.D.S., was unanimously elected an active member.

Professors H. Allen, M.D., and Albert R. Leeds, A.M., were unanimously elected honorary members.

The Corresponding Secretary informed the meeting that copies of the second volume of the "Transactions of the Odontographic Society" were ready for distribution, under the usual regulations.

Dr. O. C. White, of Massachusetts, by invitation of the Society, brought a model of an invention he had originated; a very ingenious form of movement applicable to dental chairs. He said:

The form which he had the pleasure of bringing before the Society was such as he had used and found efficient in securing position and support to the patient's back and head, in any direction that may practically be required, in all dental operations.

It has long been a desideratum in clinics, to have a wide lateral motion without disturbing the seat upon which the patient rests. With this form, great side back and front, as well as up and down motion, is obtained. It is held in position by a single thumb-screw, which is evenly turned, to hold solid and firm. The principle of its movements is to maintain a relative position and support, parallel with the spinal column in whatever position the patient may be placed. Thus, the base, a universal

joint or ball and socket, supporting a tube, in which is a sliding rod, three-quarters of an inch in diameter, curved at its upper extremity to reach forward over the back of the chair, terminating with a head rest on a ball-and-socket joint. This is secured and clamped by a screw, at the back of the upholstered work, which is done in the form of a roll on three sides, to give an easy adjustment to the head or style of dressing the hair. Across the back of the chair, a circular rod, with bearings at either end, is held in connection with the upright tube and sliding rod, by a clasp, which the thumb-screw controls, firmly securing the position in which the head rest may be placed; that is, from side to side thirty inches, back and forward fifteen inches, with an elevation of eighteen inches. It may be applied to any chair, but a low-back is recommended. Its greatest advantage may be gained on a chair made plain and with a view to universality of motion.

In answer to questions from the Society: It is intended both as a head rest and to supply the motions obtained by the complicated machinery in connection with the operating chairs at present offered to the profession. The apparatus can be readily detached, as it is not fastened into the chair.

A vote of thanks was passed by the Society to Dr. O. C. White.

Dr. Stellwagen then described a spittoon which he had had constructed and that had been used for several years without finding any important objections. It consists of a metallic exterior supporting a glass funnel and tube leading to a reservoir, which is near the floor in the base, thereby avoiding the unpleasant sights and odors that sometimes, in spite of all our efforts to keep pure, will be found in the ordinary spittoon. It is made entirely of glass and metal, may be taken apart in case of moving or cleaning; and is ornamented externally with patterns, such as are used for gas fixtures, the whole being more pleasing to the eye than the ordinary wooden box which has so much the appearance of an article of furniture foreign to the parlor or office; and in which unpleasant emanations will sometimes saturate the pores so as almost to make it impossible to be rendered inoffensive to the olfactory nerves of an ordinarily sensitive patient. When not used for the purpose for which it was constructed, he had often placed a bunch of flowers, or a bust upon it, and considered it as rather a decoration, being a pillar or column, supported upon a small pedestal. One great recommendation in its favor, is the fact that it had cost less than the wooden stands, while it was less easily put out of repair, scratched, broken, or upset.

Dr. McQuillen, as chairman of the committee appointed to test the merits of Dr. Richardson's instrument for inducing local anæsthesia (presented to the Society some time back by Dr. Wm. H. Waite, of Liverpool), made a verbal report favorable to its use in the minor operations of surgery, such as the extraction of teeth, extirpation of the dental

REPORT OF TEETH EXTRACTED WHILE LOCALLY ANÆSTHETIZED.

Sex.	Age.	Nativity.	Temperament.	Incisors.		Canine.	Bicuspids.		Molars.			Remarks.
				Cen.	*Lat.*		1st.	2d.	1st.	2d.	3d.	
Female.	22	America.	Nervo-Bilious.	Lt. Sup.	...	......	....	......	....	....	......	No pain.
"	16	"	Nervo-Sanguinous.	......	...	......	....	......	Rt. Sup.	....	......	"
"	28	England.	Sanguinous.	Rt. Sup		Rt. Sup.	{ Lt. Inf. Rt. Sup.	Rt. Inf.	{ Rt. Sup. Lt. Inf.	{ Rt. Inf. Lt. Sup.		No pain except in the Rt. Inf. 2d Molar.
"	20	"	———	......	...	......	Rt. Sup.	Rt. Sup.	....	....	......	No pain.
"	27	Ireland.	Bilio-Sanguinous.	......	...	......	Rt. Sup.	Rt. Sup.	Rt. Sup.	Rt. Sup.	......	"
Male.	14	America.	———	......	...	......	....	Rt. Sup.	....	....	......	"
Male.	25	"	Bilio-Sanguinous.	......	...	......	....	......	Lt. Sup.	....	......	"
Female.	23	Ireland.	———	......	...	......	....	......	....	Lt. Sup.	......	"
"	18	America.	Nervo-Lymphatic.	......	...	......	....	......	....	....	Rt. Inf.	"
Male.	26	"	Sanguinous.	......	...	......	....	......	Rt. Inf.*	Rt. Inf *	......	Pain.

* This patient had a large abscess at the roots of these teeth, and considerable swelling under the inferior maxilla.

pulp, amputation of fingers, removal of tumors, etc. The conclusions arrived at, were not so much based upon an experience in its use in private practice as in the Infirmary of the institution with which he was connected, where, as would be found by the citation of a number of cases in the course of the evening, the instrument had been employed with decided success.

Dr. Stellwagen then exhibited a spray producer of American manufacture, having the tubes for the liquid and the air distinct and separate, which he thought made a more perfect spray than the English instrument, with less ether. (The two being exhibited in operation, an opportunity was given for comparison.) These instruments had been employed with marked success in the dental and surgical clinics of the Philadelphia Dental College. Of the former he had the accompanying report carefully compiled by Mr. John J. Pitts, one of the students.

Dr. Wm. A. Breen mentioned having used the spray producer with varied success; but, on the whole, favorable.

Dr. J. W. Moffit considered the instrument of little value for molar teeth, but in the anterior part of the mouth he had used it with great success. He had had made one of the first in the United States. Had employed this instrument for producing local anæsthesia for surgical operations. He preferred rhigolene to ether.

Dr. O. C. White said, in connection with this matter, I will take occasion to report the removal of the dental pulp, while the sensibility was obtunded by the spray apparatus, as suggested by Dr. McQuillen at the clinic of the Philadelphia Dental College. The patient was a young lady, seventeen years of age, of nervo-lymphatic temperament, blue eyes, fair complexion, rather pale, had been suffering with pain in the teeth, more or less, for three weeks; latterly enduring severe pain. On an examination of the mouth, the trouble was found to proceed from the left central incisor, which was much decayed on the mesio-palatine surface, accompanied with periostitis. There was slight sloughing from the exposed end of the nerve, with exceeding sensibility of the part remaining. The cavity in the tooth being carefully covered with cotton, the spray was directed upon the gum and surrounding structure; not to complete blanching, though as near as consistent for a good restored circulation. A broach (which was exhibited with the pulp attached) was introduced in the length of the canal, and the pulp finally removed. No signs of pain were manifested at the complete introduction, rotation, and withdrawal of the broach, which was followed with considerable bleeding. Some of the pulp remaining, the broach was again applied, with evident signs of returned sensation. The tooth was separated by wedging, the nerve-space obliterated with orange-wood dipped at the point in creosote, but owing to want of time, the patient

was requested to come at a subsequent day for the completion of the crown-filling.*

The Society then adjourned.

CONNECTICUT STATE DENTAL ASSOCIATION.

BY DR. J. H. SMITH, NEW HAVEN.

This Association convened in Norwalk at 11.30 A.M., October 16, 1866, to hold its semi-annual meeting.

The meeting was called to order by the President, Dr. J. T. Metcalf.

Minutes of the last meeting were read and approved.

The order of business was then taken up.

The President, Dr. J. T. Metcalf, of New Haven, announced the topic of discussion to be the "Treatment of incipient decay on the approximal surfaces of the teeth both of adults and children." He said he knew of but two methods of treatment. One was to cut away the decayed portions and separate the teeth; the other was to excavate and fill them. He did not know but there was however a better way to treat such cases.

Dr. Riggs, of Hartford, said the object of restricting the questions brought before the society was to secure discussions on some particular points instead of having them of a general character. The common mode of treatment in the cases under discussion was, when a little decay was observed, no matter of what kind, for the dentist to say to the patient, "Your teeth have commenced to decay, but not enough yet to fill; wait till they are decayed far enough, and I will fill them." But I find that nine-tenths of the cases of decay may be stopped without any great expense to the patient. I hold that decay arises from two causes: first, defective formation of the enamel of the teeth; second, when the teeth are imperfectly formed. The only true mode of treatment is to separate the teeth and cut off the decay. Gold filling or any other filling does not act as a remedial agent. It is only mechanical. In cases of incipient decay, the decay should be cut off by sharp cutting instruments, and in some cases by the use of a file. The way is to cut the teeth from the under side, leaving the teeth wedge-shape between. In cutting on the under side of the teeth you do not disturb their outside appearance, but you cut them sufficiently underneath to so alter their condition as to arrest decay.

The discussion was continued by Drs. A. Hill, Sheffield, Woolworth, Welton, and others.

* December 10th, the lady appeared, the tooth in good condition; the cavity was filled, using three leaves of No. 4 adhesive gold, and the patient was discharged.

Dr. McManus, of Hartford, commended very highly Dr. Riggs' mode of treatment. He claimed that it had proved very successful, as he could bear witness from some five or six hundred cases which had come under his observation in which Dr. Riggs had operated. In producing separation, he said, I do not use a file, but a wedge; and after cutting away the decay, use sand-paper freely.

The subject of Operative Dentistry was then taken up. Dr. McManus read a paper, which he said had been prepared for another occasion, but had not been read.

A discussion then ensued on the use of arsenic in extirpating the dental pulp, which was participated in by most of the members present.

Evening Session.

The subject of Mechanical Dentistry was taken up, and the *Rubber* Question freely discussed by the members present generally.

Drs. Hill and Riggs gave a clear and candid statement, freeing themselves from any censure on the part of dentists relative to the commission on the Rubber Question.

Adjourned at 9 P.M.

After adjournment, the members of the Association were invited to partake of a supper, prepared in a room close at hand, by the thoughtful and hospitable care of Dr. Hill, of Norwalk. The table was loaded with the delicacies of the season, and the famous bivalves, so well known as peculiar to that locality, were "done up" in every inviting shape and style. The occasion, which was exceedingly pleasant and social, was made doubly so by the unexpected and welcome advent of ladies belonging to the family of our generous host. The music, furnished by a full Norwalk band, served to enliven the occasion, and rendered the enjoyment of the hungry guests complete. At a late hour the company dispersed to their several domiciles to prepare for the work yet remaining to be done.

SECOND DAY—*October* 16, 1866.

The subject of Mechanical Dentistry was resumed.

Dr. Hill, of Norwalk, thought there would long before be invented a substitute for rubber for dental purposes. The hardships now suffered by the members of the Association would, he believed, lead them to make new efforts to produce some new article to be used in its place.

Dr. Woolworth said that he had been informed by Dr. Earle, the patent agent in New Haven, that a Mr. Simpson, of Bridgeport, had produced a hard kind of rubber in a way that did not infringe on the Goodyear patent. It was produced by putting a porous horny substance in the rubber instead of sulphur, and that it would answer for dental

purposes. It was a very light substance and was fused with clear rubber by the means of heat.

Operative Dentistry was at this time resumed.

Dr. Francis, of New York City, read an essay on the subject, which was listened to by the members of the Association with unusual interest.

Dr. Hill, of Norwalk, said in reference to the matter of prices for filling teeth and other work, I think we endeavor too much to do cheap operations. In doing so we do not do the work thoroughly. We should do our work well and charge enough for it. If we try to do work cheap, we shall become botches and a disgrace to the profession.

Dr. Hurd, of New York City, made some lengthy remarks in favor of good work and good prices, and was followed in the same strain by Dr. Sheffield, of New London.

Afternoon Session.

Dr. Sage, of Bridgeport, read an essay, entitled "Ability *vs.* Compensation."

Dr. Allender, of New London, exhibited a specimen of building up of a tooth with gold.

Dr. Hill spoke of the specimen, and said it should encourage the members to imitate it.

Dr. Sheffield read a paper on the subject of "Exostosis," explaining his method of treatment.

Dr. Riggs, of Hartford, also related a case which came under his treatment.

Dr. Francis, of New York, showed the Association how to use the coffer dam in filling teeth.

Adjourned *sine die.*

NEW YORK SOCIETY OF DENTAL SURGEONS.

BY W. C. HORNE.

A VERY large and interesting meeting of this Society took place on the evening of November 21, 1866; the President, Dr. C. P. Fitch, in the chair,—the occasion being an address from Prof. McQuillen, of Philadelphia, by invitation of the Society, who, after a few words of welcome by the President, said that some time back, in a report of the proceedings of the New York Society forwarded for publication in the DENTAL COSMOS, a passage appeared as follows: "Dr. Atkinson read a criticism on Prof. McQuillen's paper on the 'Microscopy of the Dental Tissues,' claiming among other things that the cut marked Fig. 5, representing the interglobular spaces as midway of the dentinal tubuli, instead of at the periphery of the dentine, is grossly incorrect

and calculated to mislead the inquirer." This was published without comment in the September number of the magazine. A letter, however, was addressed at once to the Society, in which the speaker said: "I hold myself ready at any time or place to demonstrate by microscopical sections, that the diagram referred to is neither grossly incorrect nor calculated to mislead the inquirer." In consequence of this an invitation was extended to visit New York and address the Society. Having been informed, however, that Dr. Atkinson was absent in the South, he had delayed the visit until such time as it would be convenient for that gentleman to be present at the meeting.

As on a former occasion, at Boston, in the presence of several of the gentlemen before him, he had described the characteristics, locality, etc. of the interglobular spaces, it was not worth while to occupy time in repeating what was then said; but on the contrary, some microscopical sections of teeth, which he had prepared and brought with him, would be submitted to the impartial examination of all present as the most appropriate answer which could be offered to the objections urged. These sections had been carefully examined by Prof. Leidy, in Philadelphia, and Prof. O. W. Holmes, in Boston, during the past summer, and both of these gentlemen expressed their surprise that any one should question the self-evident facts demonstrated by them, and so fully in confirmation of the diagram referred to, with which they were familiar. They had been examined also by several other *practical* microscopists, all of whom concurred in this opinion.

The sections of teeth were then placed under three microscopes on the table, and brought into focus. The instruments employed were a Zantmyer, recently made for Dr. Stellwagen; a Smith and Beck, belonging to Dr. Atkinson; and a Nachet, to Dr. Varney. One-fifth objectives were used with all of them. Two of the sections showed the interglobular spaces, in one of which they were not merely in the neighborhood of the enamel, but scattered in profusion throughout the coronal dentine. The same was true of a section prepared by Dr. J. S. Latimer, which was exhibited. All of these clearly demonstrated the passage of the dentinal tubuli through the interglobular spaces.

A specimen intended to demonstrate the results of defective mounting by the formation of air-bubbles in Canada balsam, and how much these differed from the interglobular spaces, was shown to the members. Several drawings, on a large scale, illustrative of the microscopical appearances of dentinal structure under examination, drawn by Mr. Petit and Dr. Stellwagen, of Philadelphia, were also presented, and being admirable alike for their truthfulness and artistic execution, elicited marked attention and commendation.

After a general inspection of the microscopical objects, Dr. Atkinson, disclaiming intentional offense in any criticisms he had made on a previous

occasion, asserted that to his vision they confirmed his theory that the dentinal tubuli do not cross the spaces, which he should not call interglobular—and in fact should not give any name to them. He repeated that Kölliker never saw such a specimen as that represented in his Mic. Anat., Fig. 88; and as evidence that it was a mistake, there was nothing in his text to support the appearance presented, or stating that the tubuli crossed these spaces. Again, Dr. McQuillen said in his address on the "Microscopy of the Dental Tissues," that the presence of such spaces should be invariably regarded as physiological or normal, and now regards them as pathological under some circumstances, and physiological under other conditions. He believed them to be always pathological.

Dr. McQuillen said, from the peculiar manner in which this subject was discussed in Boston, anticipating that possibly such peculiar and untenable statements as those just made might be advanced, he had placed in his satchel before leaving home a copy of Kölliker, and of the address referred to; which he would read from, so that those present might judge for themselves as they had in the case of the sections under the microscopes. Kölliker* says: "The spaces are sometimes very wide, intersecting, and interrupting in their course many dentinal canals; sometimes they are very small so that only a few canals are touched by them. In the former case their limits are formed by distinct globular projections of 0·002—0·012 of a line or more, *which are pierced by dentinal canals and have precisely the same aspect as the dentine of which they are obviously nothing but portions*. * * * * The interglobular spaces, whose presence is normal in developing teeth, contain, during life, not fluid as might at first sight be expected, but a soft substance resembling tooth cartilage and possessing a *canaliculated structure like the dentine itself*." So much for Kölliker. Now for the remark made in the address before the CONNECTICUT STATE DENTAL ASSOCIATION. It was as follows: "Although this (the spaces) cannot always be regarded as an abnormal condition, still in defective teeth these cavities are larger and much more numerous than in perfect teeth."†

These words proved that at a time when he had not paid the marked attention to this special question which he had since devoted to it, he fully recognized the fact of these spaces being abnormal under some circumstances. Even admitting that he had really advanced the opinion attributed to him, and then changed his views with increase of knowledge, that would be nothing to his discredit; but if, after *all* the facts and arguments proved his position to be an erroneous one, he persisted in maintaining it, exception might properly be

* Kölliker's Microscopical Anatomy. Amer. ed., page 474.

† An Address on the MICROSCOPY OF THE DENTAL TISSUES. BY J. H. MCQUILLEN, M.D., D.D.S.

taken to such a course. He would say nothing further on this subject, as there was no prospect of convincing those who are either willfully blind or unable to recognize that which is so readily apparent to experienced, careful, and accurate observers; he would take advantage of the opportunity, however, to make some remarks on the USE AND ABUSE OF CRITICISM. There appeared to be an occasion for something in that direction. Attention was then directed to the advantages arising from judicious criticism in the various departments of literature, science, and art; to the fact that the defective observations, illogical reasoning, erroneous conclusions, and faulty methods of writing, too often presented in contributions to science, are thus corrected. It is a matter of some moment, however, that those who attempt to criticise the efforts of others should be thoroughly conversant with the subjects treated upon, or they would be very likely to display their own ignorance rather than succeed in proving errors to exist on the part of others. We hear much about the disadvantages arising from the authority of books; but it appeared to him that those who complained of this, evidently desired to supplant books by their feeble dicta. When it is remembered that the accumulated knowledge of past ages is embodied in books; that we must be *learners* before we can become *teachers;* that our obligations to the observers of the past and the present are *immense;* and that whatever talents may have been vouchsafed to us, our contributions will be *exceedingly small*, but as a drop in the ocean of science,—it would be well if, in place of having a mere smattering of the contents of scientific works, all would become true and devoted students of books and of nature. We are the children of the past, as well as the parents of the future; and it behooves those who have any aspirations for scientific knowledge, and particularly with the view of imparting it to others, to make themselves thoroughly conversant with the labors of the master-minds of the past and of the present. Such, indeed, is a necessary and proper training for the responsible duties devolving upon us as parents of the future. Familiarity with the records of the past induces a proper respect for the opinions of others, and, showing as it does, how often the wisest and brightest have been mistaken, it teaches the valuable lesson to advance one's views suggestively rather than in a dictatorial and dogmatical manner; to reason by induction from cause to effect, rather than to start with preconceived ideas, and then distort or deny the reliability of facts that militate against them. The philosophical mind, taking advantage of the idealism of Plato, and combining its excellences with the materialism of Aristotle, rears a scientific superstructure upon a basis of facts, but never has the audacity to set facts at defiance with a mere hypothesis that has no other existence than in the imagination of the thinker.

The personalities too often evolved in criticising the efforts of others,

in which, with a partisanship that would be disgraceful to the lowest political brawlers or scribblers, an effort is first made to impair the confidence of a community in the abilities of an opponent, and, failing in that, assails his integrity, although reprehensible, and much to be regretted, only reacts upon those who inaugurate such a course. Men conscious of the purity of their motives and the integrity of their course can well afford to permit such things to pass unanswered, satisfied that those who know them best will neither regard them as devoid of intellect nor destitute of principle, and without doubt will think more highly of them for giving their assailants a tremendous letting alone. In public life, where the antagonism of opinion and interests are more or less known to all, men must expect to be criticised, and it is only submitting to assaults by small minds with pen and ink that every one is more or less subjected to by word of mouth in the private walks of life. The mote in a brother's eye so offends us that we fail to recognize the beam in our own. So universal is this, that from every side are heard the lines of Burns:

> "Oh, wad some power the giftie gie us,
> To see oursels as ithers see us."

But how shall we see ourselves? Shall it be with the partial eye of friendship, that exaggerates every good quality, is blind to each defect, and regards its object of affection as a paragon of perfection? or shall it be with the basilisk glance of enmity that distorts commendable qualities of head and heart into vices, and recognizing no evidence of talent, principle, or honor, looks upon its object as the embodiment of everything that is mean and contemptible? Either of these extremes would be incorrect, and an all-wise Providence, no doubt for the best of purposes, has so arranged it that we do not "see ourselves as others see us;" but, looking upon our good qualities with a certain degree of complacence, and disposed to throw a much larger mantle of charity over our own shortcomings than those of our fellow-beings, we are thereby enabled to discharge our appointed work in this world more effectively than if unduly conscious of the estimate of others, whether in commendation or condemnation. No greater misfortune, however, can befall men than to be overrated by others, and particularly to overrate themselves. Look at the record of some of our generals and other public men during the past few years, elevated in the most rapid manner to the highest pinnacle of human ambition, regarded for a brief season as the equal of the greatest men of ancient or modern times, but eventually found to lack those elements of character which are demanded to maintain 'an exalted position; their descent was more rapid even than the ascent. In the estimation of the world, when such men fall, they sink below the level of mediocrity.

In conclusion, if those who are so much oppressed by the deficiencies of others would only subject themselves to thorough self-examination,

it is possible they might find some work to do in the way of self-reformation, and that after all, that is the best way to reform the world. Truly has it been said, "Better is he that ruleth his spirit than he that taketh a city."

A unanimous vote of thanks to Professor McQuillen was passed, both for his address and the interesting and valuable objects which he had exhibited.

Dr. Eleazar Parmly being called upon, complimented Dr. Atkinson for his untiring zeal in behalf of dental science. The vote of thanks which had been tendered to Prof. McQuillen, he said, was emphatically due to him, as a distinguished teacher in our profession, and one of those who had done much for its advancement, which, with his high-toned and manly character, had gained for him the friendship of men eminent in the walks of science and literature.

Dr. G. E. Hawes said he wanted to drive one nail home on the subject of criticism. Some of our generals in the late war had shown great capacity for intrenching, and he thought that very praiseworthy in its way; and he would advise those present to intrench themselves in knowledge; but if, after having done something in that direction, they did not feel themselves strong enough, he would have them evacuate their position, and we would all say, What a glorious retreat!

After some further remarks by different members, and exchange of courtesies with the visitors present, the Association adjourned to its usual time.

TRANSACTIONS OF THE BROOKLYN DENTAL ASSOCIATION.

BY W. C. HORNE, NEW YORK.

October 30.

The Association considered the Code of Dental Ethics adopted at the late meeting of the American Dental Association. The motion for its adoption met with but little favor, and the subject was tabled by a large vote.

Dr. G. T. Barker, of Philadelphia, was elected an honorary member.

November 14.

Subject, "Filling Cervico-approximal Cavities."

Dr. Clowes opened the discussion by characterizing this class of cavities, especially when extending some distance under the gum, as the most difficult encountered, and impossible, with ordinary applications, to keep dry. He expatiated upon the usefulness and indispensableness to him of the sheet rubber, and commended it to general adoption.

Dr. Marvin added his encomium to that of the previous speaker, upon Dr. Barnum's invention. In many cases he resorted to the wedge as an essential means to success in filling the class of cavities under consideration.

Dr. Francis thought so highly of the rubber for protection from saliva, that he would want to give up practice if deprived of it. It was impossible to make first-class fillings unless moisture were perfectly excluded, and this method fulfilled that condition most thoroughly.

Dr. Mills had found much discouragement in its use at first, but of late had had recourse to it in some most perplexing cases where it worked to his perfect satisfaction.

Dr. Bogue said that where the gum oozes mucus or bleeds on pressure, chloride of zinc will create a thin pellicle, preventing exudation.

Dr. Horne entered into a description of the application of the sheet rubber to various cases.

Dr. J. S. Latimer, in preparing small approximal cavities in front teeth, cuts from the labio-approximal angle across the enamel. He took exception to the term "cervical," as designating a class of cavities.

Dr. Clowes advocated the preparation of all cervical cavities with retaining points; using straight drills and fine burrs. He tempers his fine drills by heating just above a cherry color; then suddenly immersing them in a vessel containing water to the depth of a quarter of an inch; the fine point is then broken off, leaving a metallic rod of the proper temper.

Dr. Latimer suggested as a means of sharpening instruments, a pine wheel dressed with emory.

Dr. O. Hill considered the first step in filling approximal cavities to be, getting plenty of room; so, at least, as to touch all parts of the cavity easily with the plugging instrument. When the teeth are firmly set and close together, he presses cotton between them and leaves it for one or two days; this serves to loosen the teeth without making them sore, so that at a future sitting they can be easily wedged. He then excavates and wedges alternately, until the cavity is clean, not letting the excavating get in advance of the wedging. In bicuspids and molars, in addition to getting them well apart, he takes away a small portion of the grinding surface, when it will facilitate subsequent operations, and if properly replaced with gold, it in nowise impairs the tooth. Space being obtained and the cavity freed from decay, the next point is to ascertain whether it is so shaped as to retain a filling; if not, it must be made so. As a general rule, there should be three retaining points, and more if practicable, made with a chisel-shaped drill. Two of these should be in the cervical portion of the cavity, and one or more near the grinding surface, with a groove running from one point to another, serving as a general retainer. Sometimes it might seem cruel to use the drill—where the cavity is extremely sensitive, for instance; but if that cavity is a simple concave surface, it is out of the question to plug it as it is, and not having been very successful with obtunding agents (always excepting arsenic, which is apt to do too much), he finds no better course than to make the necessary points, which causes but a moment's pain and insures success. In filling, begin at the cervical wall of the cavity, taking great

pains to secure firmness and perfect adaptation at the edge next the gum, this being the weakest point in all proximate fillings: then extend the operation along the groove cut to the third point, and from that out nearly to the orifice of the cavity, which is thus lined with gold; the centre being easy of access is readily filled, and serves as a wedge to hold the first portions in place so that it is immovable in its casemate.

Dr. Atkinson considered the expression of opinion which he had heard to-night an indication of the great advancement in operative ability beyond the position of five years ago. With general approbation of what had been said, he took exception to the use of the chisel transversely to the enamel rods, as especially dangerous except in the hands of one well informed as to the microscopical structure of the dentinal tissues. As to filling cervical cavities, there was nobody present who could show a clean record for more than ten years back. To the term itself, there could be no objection, as it denoted just what it meant—a cavity at the neck of the tooth.

Dr. Varney relied upon the wedge for protection from moisture. He fills approximal cavities temporarily where the gum overhangs, with Hill's stopping, which crowds the gum up and leaves an uninflamed surface.

Dr. Marvin used the wedge and rubber both, but not together. He was not troubled with moisture from the breath once in fifty times.

Dr. Bogue said that condensation of moisture on the gold would depend on the temperature of the operating room. He mentioned a case of inordinate secretion from the mucous membrane of the mouth, where with the aid of half a dozen napkins, it was impossible to keep the mouth dry.

Dr. Atkinson suggested rinsing the mouth, in such a case, with a solution of tannin.

The Association then adjourned.

LEBANON VALLEY DENTAL ASSOCIATION.

A MEETING of the Lebanon Valley Dental Associaton was held in Lebanon on the evening of March 16, 1866, when a constitution was adopted, and the following officers chosen to serve for the ensuing year:

President.—W. K. Brenizer.

Vice-President.—T. Y. Brown.

Treasurer.—J. W. Moffitt.

Secretary.—S. H. Guilford.

At the succeeding meeting, held in Harrisburg, July 13, the president delivered a beautiful and appropriate inaugural address. Dr. Lineaweaver, of Pottsville, was elected to and received into membership. Drs. Fleming and Guilford were chosen delegates to the American Den-

tal Association. Another meeting was held in Reading, October 12, 1866. An interesting discussion of about two hours' length was had upon "Alveolar Abscess," the subject for the evening.

Dr. Guilford was chosen essayist for the next meeting, which will be held in Harrisburg, January 11.

On motion, adjourned.

S. H. Guilford, D.D.S., *Secretary.*

BIBLIOGRAPHICAL.

Illustrated Catalogue of the Museum of Comparative Zoology at Harvard College. No. 2. North American Acalephæ, by Alexander Agassiz. Cambridge, pp. 234.

A copy of this excellent work was received some time back from the author. It is by no means, as the title would seem to indicate, a mere descriptive catalogue, but contains a large amount of valuable information in relation to the different species of acalephæ (or jelly fishes, as they are popularly and erroneously named). Their embryological development, growth, anatomical characteristics, and habits are described, and much of this is the result of personal observation on the part of the author, who is favorably known to the public through that highly interesting work, Seaside Studies on Natural History—the joint production of Mrs. Louis Agassiz and himself.

The wood-cuts, three hundred and sixty in number, with the exception of a few borrowed from the Contributions to the Natural History of the United States, by his father, Prof. L. Agassiz, have been drawn from nature by the author, and, although most of them are in outline, they are finely executed, and serve very well to illustrate such subjects. The work is one which should be in the hands of American naturalists in particular, as it is the only one of the kind that has appeared in this country relative to this class of animals.

Inhalations in the Treatment of Diseases of the Respiratory Passages by the use of Atomized Fluids. By J. M. Da Costa, M.D., Physician to the Pennsylvania Hospital.

This is a monograph of 37 pages on the above subject, in which brief reference is made to the use of inhalations in the treatment of disease from the time of Hippocrates down to the present period, combined with the citation of a personal experience in the employment of such agencies in affections of the air-passages on the part of the author. The special attention which he has paid, for nearly twenty years, to diseases of the respiratory organs, gives decided value and importance to this *brochure*, which no doubt will be received with the same favor that has attended his valuable work on Medical Diagnosis.

J. H. M'Q.

SUPREME COURT OF THE DISTRICT OF COLUMBIA.

JOSIAH BACON
vs.
THOMAS O. HILLS. } 827, Equity Docket 8.

The motion for a preliminary injunction in the above entitled cause coming on for hearing upon bill and affidavits, and having been argued by counsel and duly considered by the Court, it is, this twenty-second day of December, A.D. 1866, ordered and decreed by the Court that the said motion be and the same is hereby overruled.

By order of the Court.

[Copy.]

HENRY B. GOODYEAR, Adm'r of
NELSON GOODYEAR, dec'd,
vs.
THOMAS O. HILLS. } No. 828, Equity Docket 8.

The motion for a preliminary injunction in this cause came on to be heard upon the bill, exhibits, and affidavits of the complainants, the affidavits and exhibits of the defendant, and arguments of counsel; whereupon it is ordered and decreed by the Court, this twenty-second day of December, 1866, that the motion for a temporary injunction be allowed, subject, however, to be dissolved on motion of the defendant upon reasonable notice, and on giving to the complainants security to the satisfaction of the Court that he will keep and render an account of all plates for artificial teeth, gums, palates, etc., made of hard rubber in pursuance of the invention described in the letters patent in the bill mentioned, and will pay the said complainants such sum for the use of said invention as may be adjudged and decreed to be paid on the final hearing of this cause.

By order of the Court.

[A copy.]

PERISCOPE OF MEDICAL AND GENERAL SCIENCE IN THEIR RELATIONS TO DENTISTRY.

BY GEO. J. ZIEGLER, M.D.

"*The Philosophy of Food. No II.*—In continuation of what we have already said on this subject, we may direct attention to the researches of Professor Donders, of Utrecht, but it must be remarked that although but recently made known in this country, they were published in 1864. The conclusions to which he was therefore able to attain are scarcely so satisfactory as those we have already discussed, but we think it worth our while to make known the views of this distinguished physiologist, even although they may add but little to the actual stock of our knowledge.

"To begin, then, with the foundation for a rational theory of nutrition, we find that in 1838 Mulder declared that the albuminous compounds contained in plants and animals had an identical chemical constitution. Hence it was speedily assumed that as vegetables contained both azotized and unazotized substances, they were the great preparers of the nitrogeneous substances chiefly found in animal tissues. By these, therefore, it was supposed that the bodily structure of graminivorous animals was alone maintained, while they in their turn afforded a diet far richer in nitrogen to man and other animals. Liebig's doctrines, which are now so well known, went further than this, however, distinctly limiting the *rôle* of each of these two great groups of alimentary substances—viz., the so-called *flesh-formers* and the *heat-producers*—and it is with him and his followers (*e.g.* Bischoff and Voit) that the present controversy is raging. As an example of the radical school now in opposition, we might cite M. Traube, who has founded opinions exactly the reverse of those of Liebig on the observations of Bischoff and Voit, two of Liebig's followers; while a Dutchman has gone so far as to maintain that animal food, if not injurious, is at least quite superfluous, so far as mankind is concerned.

"Donders next proceeds to point out the bearing which the doctrine of the 'Conservation of Energy' (first discovered by Mayer, in so far at least as it applies to animal mechanics) has upon the phenomena of life. Three factors have to be considered—the food taken into, the products of it excreted from, the body, and the difference between these in so far as their heat-producing powers are concerned, which is the amount of heat developed in the body, *plus* that portion of the heat which appears as actual work. This is the outline of the inquiry, but not by any means the whole of it; the sketch, as we have already pointed out, has been finished, but when the whole picture may be is a very different question. He also discusses the direct and the indirect production of heat within the body—the former produced by the immediate oxidation of combustible material, with no other result than that of raising the bodily temperature; the latter the consequence, we shall say, of muscular contraction. According to Liebig's theory, the former of these was the more important source, and it was supposed that the hydrocarbons contained in the food were entirely devoted to this purpose. What gave the first great blow to this opinion was the discovery of the fact that the blood is rather cooled than heated in the lungs, although it was by no means proved that

no heat is developed there. But when we consider that chemical change is continually going on in the body, and that either heat or electro-chemical or mechanical work must follow, we see that a considerable amount of heat must be produced by this change, to say nothing of that which must arise from the friction of one part against another when in motion. Donders next sets about the consideration of the nature and origin of muscular work; but, to properly understand this subject, it is necessary first of all to know what is meant by the term work, and we should say that the best idea of this may be got in the lifting of a weight from off the ground. But the weight must be moved. A man might pull at a body the whole day without disturbing it; if so, no work, in this its technical sense, would be done. So, again, one might hold a weight extended for a considerable period, and a feeling of weariness would be the result; still no work would be done, for could not a piece of wood or iron do the same thing, with the great advantage of never getting tired? From the notion of work the idea of motion is inseparable; but it must also be remembered that, although no motion is produced by supporting a weight, still that chemical change is going on in the muscle, and as the energy thus produced does not appear as work, it must be converted into heat. Hence Béclard calls that from which no motion is produced *statical action*, the other he distinguishes as *dynamical;* and this distinction must be continually borne in mind.

"The exact changes which take place in a muscle, when set in motion by a nerve stimulus, have been tolerably well made out, but a rough outline will here suffice. The first step is that the muscle assumes a state similar to that of an elastic band on the stretch—*i.e.* one ready for contraction, which will take place or not according to the weight to be moved, the extent of the motion being also dependent on this weight. Assuming, therefore, that no motion takes place, that no work is done, the whole of the energy must appear as heat, and should a certain amount be done, that potential energy which remains after the work has been performed—*i.e.* when the contraction and the weight are exactly equal (and there is always a certain amount over)—will assume the same state. These facts serve to show what has been proved in another manner—viz., that the whole of the bodily energy cannot appear as work, but that in all cases a certain proportion (four-fifths, says Helmholtz) appears as heat.

"Donders has also investigated the relations between the production of heat and of mechanical work in order to ascertain whether the albuminous substances contained in an ordinary diet are sufficient for the production of the former; but as we have already laid the results of more recent investigations as to this before our readers, we shall at once pass on to the discussion of the metamorphoses of the nitrogeneous tissues.

"Most, in fact we might say all, physiologists admit that the greater part of the nitrogen excreted from the body passes out by the kidneys, a small proportion also with the fæces; but it would seem to be still a moot-point whether any escapes by the lungs and skin. Regnault and Reiset's direct experiments would seem to indicate that a certain small proportion escapes in this way; indirect experiments carefully performed favor the other view (Ranke and Thiry); but Donders is inclined to accept the former result instead of the latter.

"The observations of Dr. Verloren on insects are also brought forward. This gentleman had observed that bees, when in the larval con-

dition, inclosed in a cell without the possibility of making much exertion, are fed entirely on pollen, a highly nitrogenized substance, but that, when in the condition of mature insects, and undergoing very great exertion, they feed solely on honey—that is to say, on sugar. Further, during their immature life insects excrete a large quantity of urine, and respire only to a very slight extent—that is to say, much urea and little carbonic acid escape from the body, of which he cites as an example the chyrsalis of the *Sphinx Ligustri*. While, again, the butterfly, feeding only on honey, may be almost looked upon as an animated lung. Donders does not, however, altogether agree with the conclusions of Verloren.

"As to chemical changes in muscle, two or three things worthy of note occur. Probably the most important of these is the increased quantity of creatin and creatinin found in the muscles after exertion of any kind, showing unmistakably that the albuminous matter of the part does undergo a change while acting. So, also, it would appear that lactic acid is produced, and that the accumulation of these within a muscle gives rise to the fatigue which follows prolonged or violent exertion. In the one case, however, the fatigue lasts much longer than in the other, for after greatly prolonged work there must be a greater accumulation than after violent exertion (as supporting a heavy weight) lasting only a short time. In the one case the accumulation is in the muscle, in the latter probably only in the vessels, whose contents are retarded by the contracted fibres. Ranke has shown that this fatigue may be removed by getting rid of the offending substances, while the same feeling may be abnormally superinduced by injecting the extract of fatigued muscles, or even lactic acid alone, into a part.

"Donders goes on to apply his theory to practice; but, as we have previously insisted, experience is the better guide, and until we have thoroughly succeeded in tracing every constituent of food in its transit through the body, we are not justified in dogmatizing, on any theory, as to the superior value of any article of diet. Donders, however, points out one or two very important considerations. The first of these is—that in the food of man too much regard should not be had as to what is required for muscular action, but rather to mental capacity, seeing that human labor is valuable rather as a skilled than as a powerful engine, its greatest value being its universal adaptability. Hence the difference between the diet of the day laborer and the man of business—the one cannot live upon what is best suited to the other's wants. This is still further borne out by what we know as to those nations who live mostly on vegetables; although their bodily development be tolerably good, their mental is rarely in correspondence. Still we must, we think, writing two years after Donders' paper had appeared, and knowing what advances have been made in physiology since that time, take a more advanced standpoint than he is willing to do; for, says he, 'they who actually perform work also use albumen, and in general consume more in proportion to the severity of the labor,' while we, taking everything into consideration, must say that the hydrocarbons seem to be of more importance than the albuminous compounds in such a case. Such is an outline of Donders' published opinions."—(*Med. Times and Gaz.*)

Hypothesis.—"When men of science disclaim hypothesis, they are either unfit for their vocation, or, like Newton, they are better than their creed. Hypotheses are at once the effects and causes of progress; and one might

as well attempt to preserve and employ an army without organization, as to preserve and employ phenomena without a theory to weld them into one. But the theory must be provisionally, if not positively, true; it must be intelligible and consistent; it must explain a greater number of facts and reconcile a greater variety of apparent contradictions than any which has preceded it, and it must have become developed, not by the addition merely, but the addition and solution of subsidiary explanations."—(*Ibid.*)

Legal Responsibility of Medical Men.—"The difficulties with which medical men are surrounded in the performance of their very arduous and responsible duties have been much increased of late by the result of some recent trials in courts of law. The physician who has to encounter the inherent obstacles to decision arising out of the dubious complication of symptoms which even ordinary diseases will present in singular constitutions or under extraordinary circumstances—the surgeon who has to perform operations to which he has been influenced by the preponderance of reason in a well-balanced argument presenting opposite elements for judgment—find in the toughness of the intellectual problem, and in the moral responsibility, impediments to action which often enough delay the hand, and tax the faculties of a cultivated brain and the powers of a serious and reverent mind. But more than once of late it has appeared that the decision of the physician or surgeon, however conscientiously and wisely taken, though based upon the teachings of experience having world-wide confirmation, though accordant with the common practice of all well-educated practitioners, and though customary and of everyday simplicity, may yet, by a series of circumstances over which he has no control, and for which he is blameless, involve him in public scandal, bring upon him the terrors of a criminal charge, or the worry, the cost, and the shame of a civil action for damages.

"The case of Absolon *vs.* Statham is one in which a well-qualified dentist—under circumstances of no unusual character, and with all the proper precautions of preliminary medical examination—caused chloroform to be administered, with a view to the safe and painless extraction of a number of inflamed and diseased teeth which were a cause of great pain and suffering. The facts of the case are before our readers in the report which we publish at page 561.* We can see no flaw in the preliminary proceedings of Mr. Statham, in the judgment which he exercised, or in the manner of administration of chloroform. The inventor of anæsthesia by ether had in view this particular operation of extraction of carious teeth. The painless removal of a number of diseased teeth, under the influence of chloroform, is a proceeding which is so common that we need not refer to its uses, its propriety, and its advantages to the patient. It has indeed happened more than once, unfortunately, that chloroform administered for this purpose has developed its characteristic danger, and that the patient has died from the passing effect of the vapor before the operation could be completed. The very first death from the effect of the inhalation of ether, in this country, occurred in the practice and in the house of a well-known dentist, now deceased. Such calamities have also happened to surgeons and dentists since that time, unhappily, in no small number of instances. But where, as in this case, it has been shown

* The details of the trial are too long for the pages of the DENTAL COSMOS.

that proper care was exercised in the administration, no blame has been attached to the operator. So terrible a mischance is, indeed, a severe shock to any man; and it makes us all very loth to administer chloroform, and to allow our patients to purchase an immunity from pain at a risk which endangers their lives, but which affects also our own reputation and peace of mind. These, however, are the known dangers of anæsthesia; and patients habitually waive that distant prospect of peril to save themselves the sharp pain of the forceps or the anguish of the knife.

"But in this case a new and unsuspected source of danger is produced for the surgeon—not, so far as we believe or can learn, to the patient. Symptoms of disorder of a chronic and persistent kind, which not even the most experienced medical men can in any way connect with the inhalation of chloroform, or have ever seen to arise in the scores of thousands of cases in which it has been administered, are by the patient connected with the circumstance that she inhaled chloroform, under the direction of Mr. Statham, with the view to the extraction of her teeth. No one else can connect those symptoms with such a cause: it was proved that she was hysterical and in very delicate health, a sickly and suffering woman, but she was pleased to attribute to chloroform her subsequent chronic indisposition. The evidence of Dr. Anstie, Dr. Richardson, and Dr. Sansom—three physicians of peculiarly extensive experience in practical anæsthesia,—entirely negatived the connection. It was shown that Mr. Statham carefully, conscientiously, and skillfully did his duty as a dentist; that the chloroform was properly administered by a practiced assistant, and that this duty was performed as an act of charity at a public institution. Nevertheless, the jury were divided in opinion whether Mr. Statham should or should not be mulcted in damages. We confess that we regard this case, and we believe the profession will regard it, with great pain and apprehension. The indefinite legal responsibility which it superadds to that attending neglect, ignorance, or willful misconduct is one which we can neither gauge nor appreciate. It has no palpable form or measure. We can see no offense; we can recognize no omission; we cannot discern any failure of skill or of duty. The penalty of public scandal, of two days' badgering in a court of law, of serious anxiety of mind, of considerable expense, has nevertheless been inflicted. We can recognize no moral liability to such penalty; and if, under these circumstances, there exists a legal liability, we must suggest that it will be necessary to make a formal provision against such incidents. The surgeon who is about to perform an operation, after having fully made up his mind on all the scientific aspects of the case, must, before proceeding further, obtain from his patient a legal indemnity for any indefinite liability which he may incur in a court of law. We must combine two professions—or, at least, we must call a lawyer into our consultations, and must retain standing counsel at all the hospitals and in our private practice. We must go about armed with parchments, and combine instruments of the law with those of medicine. The pocket case must have another pocket added to it; and there we must carry forms of indemnity and legal contracts ready for signature. We must invoke Themis, together with Æsculapius, to prosper our medicine and guide our scalpel. The surgeon must ask himself—how will this operation sound when described in a court of law by an adverse counsel? Malgaigne gives half a dozen proceedings for amputation of a finger; and, before adopting

either, the surgeon will have to put it to Mr. Montague Chambers or Mr. Giffard which will best suit the prejudices or is most likely to please the imagination of a common jury. But if the precedent of this case be followed, there will still be reason to fear that the jury may espouse opposite sides in the controversy; and that, after doing all that skill, care, and charity can suggest, the jury may be divided as to whether he should be heavily fined for his pains. We cannot contemplate this contingency with equanimity; and we feel that the liability to such annoyance as this is one to which the conscientious and skilled practitioner ought not to be subject.

"One word as to charity. Mr. Statham, in our opinion, committed an error by excess of charity. He gave this plaintiff, when she came to him full of griefs and sorrows and in distress, pecuniary relief. We think that hospital medical officers should be warned against giving pecuniary relief to patients on whom they have operated. It is clearly liable to misrepresentation; it may be converted into a weapon which will be used against them; and this is not the first instance in which it has been so used."—(*Lancet.*)

"*Nutritional and Vaso-Motor Affections consecutive to Neuralgia of the Fifth Nerve.* Under the care of Dr. Anstie, Westminster Hospital.—The secondary affections which occasionally occur in the course of neuralgia have attracted much notice of late years. With regard to neuralgias of the fifth cranial, more especially, it has been proved that these remoter effects of what is usually considered a 'functional' disorder of the nerve, may involve very serious consequences to the organ to which its branches are distributed. These possible sequelæ have been summed up in Dr. Anstie's second Lettsomian lecture, recently published in this journal. Among them is one affection which has never previously been formally described, so far as we are aware, as a consequence of neuralgia, viz., erysipelas; or rather it would be more proper to say, that the susceptibility to the erysipelatous influence (whatever that may be) has been shown to be greater in tissues supplied by a neuralgic than by a healthy nerve.

"In the out-patient room at Westminster Hospital, a woman, aged sixty-three, recently presented herself, in whose case the erysipelatous complication was strikingly illustrated. An attack of neuralgic pain, strictly limited to the auriculo-temporal and supra-orbital branches of the fifth cranial nerve, had been produced by exposure to cold wind. The neuralgia, at the time of observation, was of ten days' standing; but the complaint for which the patient more particularly sought relief was an erysipelatous inflammation very accurately limited to the district occupied by the ramifications of these nervous branches. The phenomena were characteristic of intense neuralgia. Thus there were intense photophobia and lachrymation in the eye of the affected side. The history of the patient disclosed the fact that more than one former attack of neuralgia in the same region had been similarly complicated with erysipelatous inflammation. Another symptom, which was also held to be secondary to the neuralgic affection, was painful thickening of the periosteum of the malar bone, at a point to which the erysipelatous inflammation did not extend.

"Dr. Anstie remarked that in this case were illustrated several of the most remarkable occasional consequences of neuralgia, or rather of the

altered dynamic nerve-status of which neuralgia is one expression. The fifth cranial nerve includes not only fibres destined to subserve common and special sensation, but also fibres which govern the calibre of vessels, and others which preside over the nutrition of tissues, and the secretion from glands. In a certain number of cases of neuralgia, not merely the sensitive, but also the vaso-motor and the nutritive fibres are influenced by the depressing cause which produces the neuralgic pain. The effect on the vaso-motor fibres produces, ordinarily, at least one result—congestion of the conjunctival vessels, and, more rarely, such an intense congestion of the vessels of the skin as (with the conjunction, probably, of some septic influence upon the blood) is sufficient to determine erysipelas. The nutritional changes which may be produced in tissues supplied by a neuralgic fifth nerve are very numerous. The present case supplied an example of one of them in the painful thickening of the periosteum immediately surrounding the issue of the malar branch of the nerve. Occasionally, however, we meet with cases in which the cycle of changes secondary to neuralgia of the trigeminus is much more completely illustrated, and such an instance had recently come under Dr. Anstie's notice in a patient to whom Mr. Ernest Hart had called his attention.

"M. W——, a woman aged forty-two, well nourished and healthy-looking, married, and had one child. She had never suffered from any serious ailment, with the exception of an illness about five years previously. On this occasion she was attacked with facial erysipelas very accurately limited to the right half of the face. Five months before coming under notice she sustained a severe mental shock from being thrown out of a chaise, without (so far as could be ascertained) suffering any physical damage whatever. An hysterical tendency, which she had always possessed, became more marked; it revealed itself by palpitations, occasional dysphagia, and a disposition to weep causelessly. The menses were flowing at the time of the accident; they ceased abruptly soon after it: they had been scanty for some time before the accident, and they did not reappear till four months after it. The hysteric disturbance progressively increased for a fortnight subsequent to the accident, when the patient was suddenly attacked with violent neuralgia, commencing in the eyeball, and spreading over the district supplied by the first and second divisions of the fifth nerve. The pain was accompanied by intense conjunctival congestion and photophobia; it lasted on the first day fourteen hours, and returned daily for the next fifteen or sixteen days. An attack of erysipelas, strictly limited to the district of the painful nervous branches, then set in. From this moment the neuralgic attacks became less frequent and less severe. A second similar onset of erysipelas occurred three or four weeks after the first. Finally, the neuralgia disappeared about four months after its first occurrence, and the menses reappeared in tolerable abundance about the same time. About a fortnight before this the patient had discovered that her right eye was dim: as the photophobia had previously disabled her from opening the eye, she cannot be sure that this was the real beginning of the dimness.

"The eye was examined carefully by Mr. Hart. The cornea was blurred by a rather large patch of interstitial lymph, with the remains of a superficial ulcer in its centre; the iris was turbid and discolored, showing traces of recent, but past, inflammation; the pupil was regular in form, and active to light. Ophthalmoscopic investigation could not be

satisfactorily carried out, owing to the state of the media. The conjunctiva was slightly congested. In place of the lachrymation which had prevailed during the neuralgic period, there was a remarkable insensibility of the lachrymal apparatus; for the patient had observed that the smell of onions had no effect on the lachrymal gland of the affected side, while that of the other side was provoked by it to intense lachrymation.

"The family history of this patient is most remarkable. All the members of her mother's family for two generations had died at middle age, either from apoplexy or from some disease involving hemiplegia.

"Dr. Anstie remarked that it was hardly possible to come to any other conclusion than that both the erysipelas and the nutritional lesions of the eye had sprung, in this case, from an adynamic condition of the fifth cranial nerve. And it was to be remarked that the family history was suggestive of a strong organic tendency to lesions of the nervous centres. It was at least probable that the constant morbid element in the case was a defective nutritive nisus in that part of the medulla oblongata corresponding to the roots of the right trigeminal nerve, and that the exciting cause of the whole series of morbid phenomena in the recent illness was the influence of mental shock upon the faulty nervous tissue existing at this point."—(*Ibid.*)

Absorption by Wounds.—The Paris correspondent of the *Med. Times and Gaz.* states that "M. Demarquay, at a meeting of the Academy of Medicine, laid before it a paper on this subject, of which the following are the chief conclusions:—1. A substance which is soluble in water, like iodide of potassium, when applied to a large denuded surface is rapidly eliminated by the saliva. 2. Applied to a recent wound, the presence of iodine is recognized in the saliva in a period of time which varies between 60, 30, 19, and 15 minutes. 3. When wounds are completely organized they possess great absorbing power, so that at the end of 10, 8, 6, or 4 minutes, and even less, very evident traces of iodine are found in the saliva. We may therefore ask whether the septic element which gives rise to puerperal fever or erysipelas may not be absorbed by the wound itself. 4. In that dangerous complication of wounds known as purulent infection, may we not suppose that this absorbing power, which has hitherto been so little investigated, plays a considerable part, and will it not explain some of the phenomena generally attributed to phlebitis? 5. Iodine injections thrown into the cavities of abscesses or cysts are rapidly absorbed, elimination having been proved to have commenced in a period varying from 45 to 3 minutes. 6. When these injections are employed in too great quantities or too often repeated, harm may result from the incessant introduction of iodine into the system. 7. Iodine introduced by these various means is generally eliminated by the saliva and urine in from 4 to 5 days."

"*Ranula.* Reported by Dr. Napheys. Surgical Clinic of Prof. Gross. Jefferson Medical College.—Miss Lizzie C., æt. 19. She has an affection of the sub-lingual gland, known as ranula, a very unusual disease in a young lady. She has had this trouble only about ten weeks. The tumor, which lies under the tongue, directly in the region of the sub-lingual gland, is perfectly soft and flabby, is painless, and does not interfere in any way with eating or swallowing.

"Ranula consists essentially in an obstruction of the excretory ducts

of the sub-lingual gland. The saliva is retained, and by pressing upon the walls of the gland a tumor is formed, which bears a striking resemblance to the belly of the tree-frog; hence its name (ranula, a little frog). Some suppose, however, that the term ranula is derived from the fact, that when the tumor is enlarged, it encroaches so much upon the mouth as to give rise to a croaking sound of the voice. It is a comparatively rare affection.

"If a tumor of this kind be permitted to advance, without any attempt to interrupt its progress, it will ultimately attain a very large bulk, and consequently, by its pressure, may displace the teeth so as to render them oblique or almost horizontal. On the other hand, it may so encroach upon the extremity of the tongue, as to push it up against the roof of the mouth, thus impeding speech, deglutition, and respiration. Again, it may press down against the hyoid bone so as to become perceptible upon the exterior of the neck. It is innoxious in character. It incommodes only by its bulk, and the pressure it exerts upon the surrounding parts. It is not even the seat of pain when of considerable size.

"It is liable to occur at nearly all periods of life. It is seldom, however, witnessed in young subjects.

"The tumor is compressible, easily indented, and fluctuates very distinctly. Upon being punctured, there escapes from it an exceedingly ropy or viscid substance, which is nothing but retained saliva in an altered condition. It is the function of the sub-lingual gland in health to throw off a certain amount of saliva constantly in the twenty four hours. When the ducts by which this excretion is effected are closed up, the fluid is retained, its watery portions are absorbed, leaving behind nothing but this peculiar thick ropy substance.

"There are various operations which may be performed for the relief of such an affection as this. One consists in evacuating the fluid, and injecting the dilute tincture of iodine, or a solution of nitrate of silver, sulphate of copper, port wine, or anything of a stimulating nature, the object being, after the evacuation of the contents of the tumor has been effected, to produce adhesive inflammation, by which the contiguous surfaces shall be glued together. Another operation consists in introducing a seton, arming a long needle with thread properly waxed, and depositing it, tying the ends together, and cutting them off close to the knot. In this way the requisite amount of adhesive inflammation is promoted, followed by the obliteration of the sac. Another operation consists in seizing hold of the wall of the tumor, transfixing it with a tenaculum, and then with a pair of scissors, or sharp bistoury, or scalpel, cutting off a considerable portion of the tumor; the contents escape, followed by a collapse of the sac, and by an amount of inflammation which will eventuate in the obliteration of the sac. This is the operation which will be performed here. It is very simple, not painful, and successful. Sometimes it happens, in spite of all precautions and the greatest care, that there is a reproduction of the tumor; a portion of it remains unobliterated, and becomes the starting-point of new development.

"The anterior prevenient section was snipped off, followed by an instantaneous escape of its contents. The fluid was very viscid."—(*Med. and Surg. Reporter.*)

Tooth discharged from the Chin.—In the report of the Lycoming County Medical Society, in the *Trans. of the Med. Soc. of Penn.*, Dr. S. Pollock states: "A lady of my acquaintance residing near Williams-

port, when a young girl had an abscess on her chin. It was very painful, and, after the usual application of warm fomentations and poultices, was duly opened. This occurred about forty years ago. After some time, the wound healed. No more attention was paid to it for several years, when it again made its appearance in the same place, and was again opened, yet remained painful for a long period, but finally healed, and for a number of years appeared well. The chin, however, again became inflamed, suppuration occurred, and since that time, for nineteen years, there has been a thin watery putrid matter discharging constantly. In May, 1854, she accidentally received a blow on the chin over the spot affected, which caused her a great deal of pain for the space of six weeks; at the end of which time, to her great surprise and astonishment, a tooth, a natural tooth, protruded through the orifice in her chin,—the apex of the tooth first making its appearance. It resembles an incisor tooth fully developed. In a short time the wound healed, and remains so to this day."

Artificial Teeth swallowed and passed through the Bowels.—Dr. Thos. Galt, of Rock Island, Ill., relates in the *Medical and Surgical Reporter* the following interesting case of this kind: "A few weeks ago, I was summoned in haste to see Mr. W., a respectable resident of this city, and found him much agitated, and suffering acute pain in the stomach. He is subject to epileptic fits, and stated, that on the previous evening, just before retiring for the night, he had an attack, which lasted ten minutes. After recovering, he suffered considerable pain in the throat, which was soon transferred to the chest, and then to the stomach, where it still continued. He did not feel alarmed until in the morning, when, on search being made for his *false teeth*, they could not be found, and he had now become convinced, that while in a fit he had swallowed them.

"The teeth, seven in number, four on the right, and three on the left of the incisors (which latter were sound and in their places), were on a gold plate, extending almost entirely around the upper jaw, and were kept in position by means of clasps embracing a molar on each side. These clasps, extending only about three-quarters around the two teeth, were of course open, presenting tolerable sharp prongs at each extremity of the plate, rendering them liable to catch and effect a lodgment in the intestines.

"These statements being corroborated by his family, I concluded he had swallowed the teeth, and recommended a course of mild cathartics; meantime to abstain from solid food, and drink abundantly of soups, broths, and slippery-elm water.

"I heard nothing more from the patient for several weeks, when being called to see another member of the family, I learned, that about a week after my former visit, he had passed the plate and teeth entire, and was now wearing them, the trip through the primæ viæ not having changed their form, or impaired their usefulness.

"He stated, that as the plate advanced, he suffered severe pain at different points in his bowels; and that on such occasions, he would lie down, change his position, and manipulate the abdomen until the pain ceased.

"I send you this statement of the case, thinking it might interest some of your readers, and as showing how formidable an obstacle may be received into the stomach, without producing any serious disturbance."

"*Metallic Spectacles.*—M. FOUCAULT recently communicated to the French Academy of Sciences the fact that the sun may be viewed through a lens covered with silver leaf. The sun's disk, shorn of its beams, can thus be clearly seen. Subsequently, M. Melscius made a useful application of Foucault's discovery. Having been injured while making an experiment in the laboratory, his eyes were painfully affected by light. In this condition, he had recourse to spectacles with black glasses, such as are used by engine-drivers; over these he put green glasses, which answered pretty well; but on further experiment, he found the best method was to use pale-blue goggles covered with silver or gold film, and these he recommends to all persons troubled with weak eyes."—(*Ibid.*)

"*Effect of Sunshine on Fire.*—At the meeting of the Scientific Association at Buffalo, Prof. Horsford, of Cambridge, read a very interesting paper on the above subject.

"He commenced by alluding to the popular notion that sunshine deadens fires, mentioning that the fires in grates in rooms having southern exposures burn briskly in the early part of the day, slacken before noon, and revive again before sunset. Stoves and ranges that bake well in the autumn, winter, and spring, fulfill their office but indifferently in the middle of the day in the height of summer. Some furnaces, in which iron is generally smelted without difficulty, cannot in very hot terms be brought to a working heat. While the popular mind ascribes these effects to some agency of the sun, scientific men are disposed to regard the effects as rather apparent than real.

"The first recorded research bearing upon the subject was made as long ago as 1825, by Dr. Thomas McKeever, who found, as he conceived, the popular impression sustained. In his experiments a given weight of wax taper was consumed quicker in the dark than when exposed to the sun. A given length of candle required less time for combustion in the dark than in sunshine. A given weight burned quicker in a painted lantern than in an uncoated lantern, both alike exposed to the sun.

"These experiments did not find acceptance with Gmelin, and did not appear in the original Handbook of Chemistry, doubtless from a conviction that some error must have occurred either in the method or record of observation. Nevertheless, Dr. McKeever's experiments appear as additions in the Cavendish Society's translation of the Handbook. The summary of his results may be stated thus: It required eleven minutes to burn in the sunshine the same weight of candle that burned in the dark in ten minutes.

"Similar experiments were made at a later period by Dr. Morrill Wyman, of Cambridge, and reported to the American Academy of Arts and Sciences. The result at which he arrived was exactly the reverse of that reached by Dr. McKeever. He burned two sperm candles, each alternately for half an hour in the sunshine and darkness, and found the candle during its exposure to sunshine burned more rapidly than when in the dark.

"In 1856, the subject was taken up by Prof. Joseph Le Conte, of Columbia, S. C. He concentrated, with the aid of a reflector and burning glass, the sun's rays upon the flame only of a wax (sperm) candle in a large dark room. At the same time another candle was burning in the same room under identical circumstances, except that the flame was not exposed to the sun's rays. The result showed that the effect of the sun's rays, though greatly exaggerated by concentration, when confined to the flame did not appreciably increase the consumption of tallow.

"Here, then, we have apparently all possible results of experiment, to wit: Sunshine diminishing the rate of combustion, as observed by Dr. McKeever; augmenting the rate, as observed by Dr. Wyman; and producing upon it no effect whatever, as shown by Prof. Le Conte.

"Prof. Horsford's paper concluded with the following summary:

"First. That sunshine falling on the flame only of a burning body does not affect its rate of combustion.

"Second. That, other things being equal, neither light nor darkness exerts appreciable influence on the rate of combustion.

"Third. That, other things being equal, of two samples of the same combustible, one burning in sunshine will consume more rapidly than one burning in darkness.

"Fourth. That combustion during the winter is more vigorous than in the summer, because a given volume of air contains more oxygen—is denser and drier.

"Fifth. That slight currents, by causing a flame to flare and come in contact with more air in a given time, cause more rapid combustion, and by presenting greater surface from which radiant heat issues to warm the combustible about to be burned, increase the rate of combustion.

"Sixth. That the diminished draught of chimneys in very hot weather, when the general atmosphere is at rest, and the sunshine intense, is due to upward currents on the outside of the house, arising from the heated surfaces of the roof and walls, which currents, by friction, draw outward, through cracks and open doors and windows, the air from the interior of the house, and so lessen the pressure within and overcome the draft of the chimney.

"Seventh. That the popular impression that intense sunshine lessens the draught of chimneys is founded in fact."—(*Jour. Applied Chemistry.*)

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"*Colors in their Relation to Artificial Light.*—Never select colors in the evening, is an old maxim whose value can be attested by many a disappointed purchaser, who, ignorant or disregarding this advice, and deeming himself the favored possessor of some tint of rare excellence, discovers on the return of daylight a color far from equaling his anticipations. The artist, overtaken by darkness, hastens to apply the last touches to some master-piece, but the morning light reveals how poorly his intentions have been realized. The cause of this inconstancy is explained, and a remedy suggested, in a late article in the *Photographic News.*

"From the spectral analysis, we learn that the flames of our lamps or gas lights contain sodium, which, in burning, yields a yellow flame, as strontium gives a red, and iridium a blue flame. Now when the color blue is illuminated by the yellow light it appears green, but if the flame strikes a color complementary to yellow it will appear white or black, according as the body has or has not the power of reflection; which is equivalent to saying that this flame alters the nature of colors, deepening the hues of some and extinguishing others.

"Take a spirit lamp and put into it a piece of common salt, the wick will soon become saturated with sodium in solution, the flame, in consequence, will be yellow, and all colors will assume a monotonous white, black, or gray. It is only when this substance is in excess that we have the total extinction of colors; but a flame less rich will produce a partial extinction, and this is the reason why colors are at all visible by gas light.

It may be asked, where does illuminating gas derive this sodium? From the coal, from water with which the gas was washed; it comes also from matters employed in its purification, and probably even from the atmosphere.

"The only hues which resist only slightly the yellow flame are furnished by the blue; all the other colors are profoundly modified. Fortunately the flames which serve as sources of light are never saturated with sodium, hence the effects are greatly modified.

"The light from the burning of magnesium alone brings out the various colors, both natural and artificial, in the same hues as they appear by daylight. The services of chemistry render, then, to painting not only colors more or less rich, but also it has endowed it with a mode of lighting, whereby the painter may be able to work at night without incurring mistakes or illusions."—(*Sci. Amer.*)

Soluble Glass.—ADOLPHUS OTT, of Philadelphia, communicates to the *Sci. Amer.* the following of interest on this subject: "In your valuable paper of the 17th inst., you state that the silicates of soda and potash have been known for more than a century. I beg to differ with you in opinion. Although it is known that as early 1640 it was observed by von Helmont that a compound consisting of quartz, sand, and a surplus of alkali was liquefied when exposed to the air, yet those definite combinations of silica with soda or potassa, which we call soluble glass, were not prepared until 1825; they were discovered by the German chemist Fuchs. There are four kinds of soluble glass: 1. The silicate of soda; 2. Silicate of potassa; 3. Silicate of soda and potassa; and 4. Soluble glass for fixing colors, mainly a combination with silica saturated double silicate. For the preparation of these various kinds of silicates, Fuchs has given the following prescription:

"Silicate of potassa, 45 parts quartz, 30 parts potassa, 3 parts charcoal. Silicate of soda, 45 quartz, 23 calcined soda, 3 charcoal, or 100 quartz, 60 calcined glauber salt, 15 charcoal. Double silicate, 100 quartz, 28 potassa, 22 soda, 6 charcoal. The ingredients here named are to be ground, thoroughly mixed, and then melted together, which operation is conducted best in a glass furnace; the melted mass is at last boiled in water and the thereby-obtained liquor forms the soluble glass. The last of the above named kinds is obtained by melting together 30 parts of calcined soda with 20 parts of quartz, and mixing the liquid obtained with silicate of potassa.

"Soluble glass has, since its discovery, been proposed for quite a number of applications, both in industry and arts. Many of these, not being practical, have been abandoned; but its applicability for making inflammable bodies fire-proof, when coated or impregnated with it, is of real value; it may, for this purpose, previously be mixed with ground clay, chalk, blast-furnace slags, feldspar, or other similar substances.

"Soluble glass may also be mixed with colors, forming fire-proof paints. We hear that this manufacture is carried on by the 'Atlantic Quartz Company,' in West Philadelphia, on quite a large plan.

"The soluble glass has also given birth to a new kind of fresco painting, named by Fuchs 'stereochromy.' In this kind of painting the soluble glass forms the ground and also the binding of the colors, which are really silicified with it, and stand, therefore, the atmospheric influences which destroy so easily common frescoes. For stereochromic colors

these are recommened: fine white, chrome green, cobalt green, chrome red, the American vermilion, iron minium, sulphide of cadmium, ultra marine, ochre, terra di sienna, and umber. Sulphide of mercury, the old vermilion, cannot be used, getting brown, and finally black, by exposure to light."

"*Hard Hydraulic Cement.*—The following receipt is given for a cement which it is said has been used with great success in covering terraces, lining basins, soldering stones, etc., and everywhere resists the filtration of water. It is so hard that it scratches iron. It is formed of ninety-three parts of well-burned brick, and seven parts litharge, made plastic with linseed oil. The brick and litharge are pulverized; the latter must always be reduced to a very fine powder; they are mixed together, and enough of linseed oil added. It is then applied in the manner of plaster, the body that is to be covered being previously wet with a sponge. This precaution is indispensable, otherwise the oil would filter through the body and prevent the mastic from acquiring the desired hardness. When it is extended over a large surface, it sometimes happens to have flaws in it, which must be filled up with a fresh quantity of the cement. In three or four days it becomes firm. If its advantages have not been overrated it must be a very excellent cement for making the joints of aquariums water tight."—(*Drug. Circular.*)

"*Platinized copper vessels* are said to equal those of platinum for containing strong acid, etc., and are much cheaper."—(*Ibid.*)

Glycerin in the Arts.—"A German chemist named Pusher, a native of Nuremberg, reported to the Trades Union of that place, that he met with great success in using glycerin together with glue. While generally, after the drying of glue, the thing to which it is applied is liable to break, tear, or spring off, if a quantity of glycerin, equal to a quarter of the quantity of glue, be mixed with it, that defect will entirely disappear. Pusher also made use of this glue as lining for leather, for making globe frames, and for smoothing parchment and chalk paper. He also used it for polishing, mixing wax with the glycerin, and using it as an underground for laying on aniline red color. The red was found to exceed all others in which glycerin is not used. The glycerin has also some properties in common with India-rubber, for it will blot out pencil marks from paper, so as to leave no mark whatever.

"A paste made of starch, glycerin, and gypsum will maintain its plasticity and adhesiveness longer than any other known cement, and does therefore recommend itself for cementing chemical instruments, and apparatus used by pharmacists."—(*Journal of Applied Chemistry.*)

"*Formation of a Substance resembling Artificial Tannin from Coal.* By WILLIAM SKEY, Analyst to the Geological Survey of New Zealand.—When either bituminous coal or lignite is heated with nitric acid for some considerable time, and then the whole evaporated to dryness, a dark-brown substance is left, a large portion of which is soluble in water, and the more readily when heated with it.

"The substance thus dissolved by the water has a bitter and somewhat astringent taste, and it readily precipitates gelatine and albumen from their aqueous solution.

"Both the soluble and insoluble portions are readily soluble in alcohol and ether, in caustic or carbonated alkali, and also in concentrated sulphuric acid, forming therewith a dark-red solution, and from which the part insoluble in water is reprecipitated by dilution; and, further, they appear to contain the elements of nitric acid, as manifested by chemical tests, and by their behavior on ignition, their combustion being very rapid and complete, accompanied with a slight explosion.

"These reactions would seem to indicate that, by the action of nitric acid upon coal, substances are produced analogous to the artificial tannin and picric acid obtained by the action of the same acid upon resin, and therefore distinct from the humic acid series of compounds produced from coal by the application of alkaline agents, with which, I apprehend, they have been confounded."—(*Chem. News.*)

Electricity from Machinery.—"The Lowell (Mass.) *Courier*, of March 23, says: It is a general truth that friction develops electricity, and most workmen know that a machine belt at a high speed by its friction in the air is highly electrified. It has for years been a common experiment for workmen to light gas-burners by holding one hand to a fast-going belt and the other to the open burner. This matter was curiously demonstrated in the Appleton Mills of this city on Wednesday. A strong smell of fire being noticed, the premises were carefully searched, and a small quantity of cotton lint on the inside of a belt casing was found on fire. The lint lay upon a beam which was within four inches of a belt some 15 inches wide and making 220 revolutions a minute. In the beam was an iron bolt, the head of which was toward the belt. From the belt to the bolt was passing a stream of electric sparks, which had set the cotton lint on fire. After attending to this case, Mr. Motley, the agent, opened the casing of a similar belt in another mill. The beam in this case was fourteen inches from the belt, but the stream of electric sparks was at once seen jumping across the beam, although it had not set fire to anything. Perhaps some of the cases of fire from supposed 'spontaneous combustion' are due to electricity from machinery. The subject is an interesting one for investigation, and probably a profitable one."—(*Med. and Surgical Pioneer.*)

"*Porosity of Caoutchouc.*—M. PAYEN states in *Comptes Rendus* that a microscopic examination of thin sheets of caoutchouc discloses minute holes or pores, which are rounded, and communicate with each other. Contact with liquid makes these pores more distinct. Vulcanized Indian-rubber exhibits narrower cavities and concentric circles spreading from one pore to another, showing successive zones of diminishing action of the sulphur. By exposure to water the caoutchouc becomes whiter and opaque through absorbing the fluid. M. Payen considers this porosity to be concerned in the dialytic action of Indian-rubber on gases discovered by Professor Graham."—(*Intellectual Observer.*)

"*Baths for Electro-Plating.*—*Gold Bath.* Dissolve 16 ounces cyanide of potassium in 100 ounces of distilled water, filter and introduce in the liquor 1 ounce cyanide of gold, carefully prepared, well washed and dried out of the light; keep the liquor in a bottle well corked, shake it often and keep it out of the light at a temperature of 59 to 77 deg. After two or three days the solution is complete and can be used.

"*Silver Bath.* In 100 ounces of distilled water, dissolve 10 ounces of cyanide of potassium, add to it, by small portions, 1 ounce of cyanide of silver well diluted with distilled water; let it macerate for two or three days, and then it is ready for use."—(*Journal of Applied Chemistry.*)

"*Spongy Platinum.*—The following method is recommended for preparing spongy platinum: when sal ammoniac is added to a solution of platinum in aqua-regia, a precipitate consisting of the double chloride of platinum and ammonium is formed. If this double salt be heated to redness, its volatile constituents escape into the atmosphere and leave the platinum behind in porous and slightly adherent masses—as spongy platinum, in fact."—(*Ibid.*)

"*Composition of U. S. Coin.*—The gold coin of the United States is thus formed: gold ninety parts, silver two and a half, copper seven and a half. The silver coin is thus composed: silver ninety parts, copper ten."—(*Ibid.*)

Paraffin for Glass and Cork Stoppers.—"The ground stoppers of caustic alkali bottles incrustate very rapidly; the grease stops it but imperfectly, and introduces fatty bodies in the lye. Paraffin is the best agent, because lye is without action on it, and lubrefies perfectly the surfaces in contact."—(*Ibid.*)

"*To keep Mercurial Steam Gauges perfectly clean Inside.*—General experience has shown that the mercurial steam gauges in the course of time often become dirty in their interior by mercury and its oxide adhering to the glass, so that it is very difficult to see the position of the surface of the mercury. The consequence is, of course, an uncertainty as to the amount of steam pressure. A simple and very effective remedy, is to bring on the surface of the mercury a little glycerin; this serves as a lubricator for glass and mercury, covering the surface of both, preventing their immediate contact, and consequently all adhesion, and keeping it always clean and bright. This simple remedy is spoken very highly of by all who have tried it."—(*Sci. Am.*)

"*To prevent Rats from damaging Leather Belting.*—It is not an uncommon occurrence in factories where steam power is used, that during the night or periods that the machinery is stationary or the shop abandoned, the rats will eat the leather belting where it is accessible to them; for instance, where it passes through openings in the floor; cases have even happened that they gnawed holes in the floor just over the place where a belt was running horizontally in order to reach and eat pieces out of it.

"Now, it is a singular fact that rats will not touch anything containing castor oil, or even only covered with it, and, therefore, to guard belting against the voracity of these animals, all we have to do is to touch it at every place where belting is exposed to their attacks with a brush previously dipped in castor oil.

"The antipathy of the rats against this useful oil is really strange. Probably their instinct teaches them that it is injurious to them; but it is useful for men to know this in order to guard many substances against their voracious appetite."—(*Ibid.*)

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ORIGINAL COMMUNICATIONS.

INJURIOUS EFFECTS OF THE TINCTURE OF MURIATE OF IRON ON THE TEETH.

BY J. H. M'QUILLEN, M.D., D.D.S.,

PROFESSOR OF ANATOMY, PHYSIOLOGY, AND HYGIENE, IN THE PHILADELPHIA DENTAL COLLEGE.

Fully recognizing the value and importance of the different preparations of iron in diseases characterized by debility and languid circulation, such as the chlorosis, hysteria, chorea, etc., of school-girls, I feel impelled by a sense of duty to the rising generation, to protest against the indiscriminate manner in which the remedy that heads this article, and other acid preparations of iron, are employed by some of our physicians, apparently with an utter disregard (for it cannot be ignorance) of their effects upon the teeth of patients. Over and again I have had under my care pale, languid creatures who have been subjected to the forcing system practiced in those intellectual conservatories denominated academies for young ladies, in which more hours are demanded per diem in mastering the lessons that are to be gotten by rote than the majority of scientific or literary men, in the full vigor of intellectual activity, would devote to their pursuits, and where neither time nor opportunity is afforded for healthful exercise. Even when some attention is paid to the latter, as a general thing a series of mechanical motions are performed, in which the mind takes little or no interest, and the body derives none of the advantages arising from the games and rompings of other days. Superadded to this, as a rule, there has been a disinclination on the part of such persons for animal food, and a morbid craving for pastry, sweetmeats, etc.

With the intellectual faculties, developed at the expense of the physical organism, and the latter deprived not only of exercise, but also of the

nutriment demanded to supply the incessant waste taking place in the tissues, it is not surprising that the health should become seriously impaired. Under such circumstances, in place of continuing the hot-house culture, and dosing a poor creature for months with those acid preparations of iron which act so destructively upon the teeth, would it not be the part of wisdom to have her removed from school, for a season at least, and either suspend her studies entirely, or pursue them with more moderation and real benefit at home; to afford her every opportunity for exercise, particularly in the open air; and prescribe a dietetic regimen calculated to meet the demands of the case, along with the pyrophosphate of iron, or chemical food if indicated? Such a course would not only be better for the system at large, but also for the teeth of such invalids.

In the cases referred to as coming under my observation, the reverse of this had been adopted, and the destructive influences of the acid preparations upon the teeth made markedly evident to the most casual observer. As an illustration, a young lady at present under my care, whose teeth, originally of excellent material, are now in a most dilapidated condition, informs me that she has taken the tincture of muriate of iron almost daily during the past year. In her case, not only the affinity between hydrochloric or muriatic acid and the lime in the teeth has been fully demonstrated, but in addition the impropriety of an indiscriminate use of that valuable remedy. Employed, as this agent sometimes is, for a week or weeks, with the direction to "take fifteen drops every two hours in a little water," without any caution or corrective against its deleterious influences upon the teeth, it is no wonder that organs which are so important to health and appearance as the teeth should have their integrity seriously if not irremediably affected.

In this connection, I would take occasion to say that the moderate and judicious use of vinegar (not the artificial preparations made from sulphuric and other mineral acids, but the natural article obtained by acetous fermentation of cider, wine, etc.) as a condiment, along with wholesome food, is beneficial to the system at large, and by no means injurious to the teeth, for the affinity between acetic acid and lime is comparatively slight. When used in excess, it impairs the digestive organs, and thus may indirectly act upon the teeth.

It is largely owing to their acids that fruits and vegetables are so useful and necessary to the human economy. Prolonged abstinence from them is a prolific cause of scurvy among sailors on long voyages, and when that affection makes its appearance on shipboard, limes, lemon-juice, and pickles are found to be the best and most reliable correctives. While thus valuable, either as prophylactics or correctives of disease, on sea voyages, they are equally important as articles of diet on land in maintaining the health of man.

NOTES OF EXPERIMENTAL OBSERVATIONS ON THE DIMINUTION OF SENSE OF TASTE.

BY RUFUS KING BROWNE, M.D.,
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The question of the effects of injury to the facial nerve on the sense of taste being unsettled, we were recently in proper circumstances, during the course of some experiments on the glosso-pharyngei, to observe with reference to it.

Bernard had reported, as the result of his partial observation, that when the facial nerve is divided or seriously injured above the point of emergence from the stylo-mastoid foramen, there is a diminished sense of taste on the same side of the tongue, but at the same time the general sensibility remains. He thought it, therefore, more than probable that this effect was due to the chorda-tympani, for, if the facial trunk be divided after the chorda-tympani has left it, no effect is produced on the sense of taste.

In an animal in which this diminution of the special sense of taste had been effected by division of the facial, the phenomena were attentively observed.

The fact was perplexing, but on prolonged attention and consideration, was found explicable. The explanation, however, requires a clear understanding of a better theory of *taste.*

The sense of taste in its peculiar organ differs from the sensibility of other organs, in only an *accessory* character, which exists not in virtue of any mere modification or alteration of common or *systemic* sensibility, but by the peculiar anatomical structure and action of that organ—a structure which involves in its peculiarity the nervous tissue, which as arranged in other parts supplies common sensibility only.

From this peculiar anatomical constitution of the nervous and other tissue composing the organ, arises the *accessory* character which we distinguish as that of taste.

Beside this, and supplementary to these anatomical conditions, there are also certain *physiological* conditions essential to the perfect performance of the *function* of taste—such as the various and peculiar buccal, faucial, and pharyngeal secretions, and associated movements of the conjoined muscular parts.

Any modification, arrest, or disturbance of either of these peculiar anatomical or physiological conditions, will affect only the accessory character of the function; but this alteration of the conditions under which we taste, will neither disturb nor impair the *common sensibility, which is invariably found to be intact* in all cases in which this diminution of taste has occurred.

Any diminution, therefore, of the secretory or motor functions, which aid in the exercise of taste, and which take place through the medium of the facial, and constitute the physiological conditions of the occurrence of the sense of taste in any specific case, will be at once signalized by *diminishing* the completeness or perfection of it.

A test and proof of this explanation is found in the well-known fact that the destruction of common sensibility in the tongue involves the loss of all power of taste; and since this is at once accomplished in its anterior two-thirds by division of the lingual branch of the fifth pair, and in its posterior third by division of the glosso-pharyngei, the chorda-tympani being intact, the latter nerve is not in any sense nor degree a nerve of sense to the tongue.

The destruction of the glosso-pharyngei in the vicinity of its cerebral origin will immediately cause this destruction, and hence we may consider it experimentally settled that the destruction of the chorda-tympani only affects the sense, as a secondary consequence of the withdrawal of its influence from the various secretory and motor functions, upon which the complete performance of the function of taste depends.

This diminution of taste so puzzled Stich of Germany, as it had others (who observed it in a number of cases in man), that, in the absence of any definite and comprehensive explanation, he was impelled to attribute it not to injury to the facial, but to fibres derived from the fifth pair. He apparently was not aware that section of the fibres of the fifth will occasion not the above phenomena—not the phenomena of *diminution* of taste with retention of common sensibility—but an *extinction* of common sensibility, involving a complete loss of taste.

In the course of our experiments we have met with a fact which corroborates this view, namely: the fact that the diminution of taste, on division of the tympanitic branch of the facial, does not at all involve the posterior (root) part of the tongue. For in this part of the tongue, although ordinarily subservient to taste, the anatomical and even physiological conditions from which the accessory character we call taste arises, are very different. Here the secretion is mucoid, and serves merely the purpose of providing a very slippery coat for the passage of the food through the fauces; while the saliva freely poured into the anterior part of the mouth, and which especially gives the fluid basis of the taste, is mainly mingled with the bolus of food before it reaches the posterior portion. These fluids do not bathe this portion of the mucous membrane, nor exert their influence upon it; nor are the comminuted portions of food, before they are *amassed* in the bolus, brought into contact with it. In addition to this physiological variation, relating to the two parts, there is the further anatomical difference, that in the posterior part the secreting structure of the tongue mostly consists of follicles, providing substance that has little or nothing directly to do in exciting gustation.

In this part, therefore, as we have said, although its proper sensibility remains, when the glosso-pharyngei are entire, section of the tympanitic branch of the facial has no observable effect—at least we found none.

SURGICAL DEPARTMENT OF THE PHILADELPHIA DENTAL COLLEGE.

Under the charge of James E. Garretson, M.D., D.D.S.

CLINIC REPORT.

BY H. L. GILMOUR.

CASE FIRST. *Necrosis of the inferior maxilla.*—H. S. This was the person of the little German boy exhibited at a previous clinic.

In general health he looked better than when last before the class, the local trouble, however, seeming worse. Dr. Garretson remarked, on examination, that he found the bone now ready to be removed, and which operation he would perform before the class.

In his clinical observation on this case, the doctor remarked that the surgeon always directed his attention to the saving of tissue, and the obtaining for the sequestrum an envelope of new bone—that is, when the full circumference of the bone is destroyed. The supporting treatment was to be brought into requisition as soon as acute inflammatory action had passed. Such treatment consisted in good diet, and indicated medical tonics.

In this case, the effect of such tonic treatment would be seen to be most marked, the patient looking quite equal to the necessary operation.

Attempt to make new bone in this case has, however, signally failed. Everything possible has been done, both by local and constitutional treatment, but all unsuccessful. The case is, on this account, particularly instructive. The removal of the dead bone would, to some extent, deform the lad, but a drain kept up by its non-removal would be sure to destroy him. There are no two sides to the question; we must take away the dead jaw, and do as circumstances indicate afterward.

The only difficulty in getting away the bone is to be found, in cases of this kind, in the indurations of the surrounding soft parts; they envelop the sequestrum as a semi-cartilaginous ring. In an extensive necrosis such as this, the relations of this ring always make it more or less difficult to decide as to the exact condition of the bone—that is, whether it is exfoliated or not. A test of such condition, which would seldom deceive, consisted in passing a hook under the body of the bone, and lifting: if it was felt to move with a springy feel, it was in a condition to remove; if it would not so yield, it had better for the time be let alone.

The reasons that in this case we have not been able to get the envelope

of new bone must be looked for in the condition of the patient. Every feature marks him as afflicted with scrofulosis; his necrosis is not traumatic, but a sequel to measles—the first of this kind, so far as the doctor knew, on record.

The lad was now profoundly etherized, and the bone removed from the cuspid tooth to the temporal articulation. Considerable dissection was necessary to get away the coronoid and articulating processes, the induration being so extensive.

Stress was laid on the care necessary to avoid the internal carotid artery.

Ordered the 1-16 of a grain of morph. acetatis, the local application of lead-water and laudanum, and the repeated syringing of the parts with a solution of the permanganate of potash.

Case Second. *Phosphor necrosis of whole body of the inferior maxillæ.*—J. B. This case had been before the class previously. From this man Dr. G. removed all the lower jaw anterior to the ramii, and yet there was no deformity. But here is life force, and we have secured the new bone.

When the sequestrum was taken away, it lay in an osseous gutter; hence there was no break in the continuity of the parts, and of course no deformity.

The patient looked as if his mouth had been prepared for a lower set of teeth; certainly he looked no worse than any patient so situated in the dental department. In the upper lecture room of the college there is the photograph of a young lady treated by the doctor for seven months, just as this patient had been, and new bone was forming in her case beautifully. She also had phosphor necrosis of the body of the bone.

At the end of this time, however, getting tired of what seemed to her no doubt an unnecessarily slow treatment, she submitted to an injudicious suggestion for a more hurried cure of her trouble, by resection, and she died of pyemia in one week.

In three more months he would have had her as well and undeformed as this patient. To resect is always bad—remember this. The highest duty of the surgeon is to attend with judgment upon nature. In these cases one must seldom expect a cure under nine months. Preserve the periosteum by keeping it wedged off from the dying bone. This is easily effected by introducing cotton or sponge between the bones and membrane; the swelling of the tent secures this end.

Cleanliness in these cases is a life necessity. You cannot keep the parts too clean. Attention to the support of the life forces is another matter of the greatest concern. The wear and tear upon the patient is immense. Exhaustion before exfoliation is the great danger to be apprehended—this and blood poisoning. Support the life forces, and keep the part clean; these are the two great commandments upon which hang all the rest.

In these prolonged cases you will be almost certain, as in this case, to have one, two, or more sinuses open on the neck, and you will be fortunate if you are able to avoid such a result. Once formed, you need not expect to heal them until the bone is ready to come away; and when this occurs, they will get well themselves.

Dress them with charpie; this absorbs the pus, and answers well the purposes of cleanliness.

We will now pass this patient to the department of mechanical dentistry, from which, no doubt, he will come out about as good as new.

CASE THIRD. *Torticollis.*—John ——, colored lad, 16 years old; lymphatic temperament, and a decided tendency to scrofulosis.

He is presented to the class with a marked distortion, produced by a shortening of the right sterno-cleido-mastoid muscle; the head being carried down to the right shoulder, the face turned and fixed in the opposite direction, and the chin slightly advanced.

Before the anatomy of the parts involved in the operation was entered upon, the class was invited to examine the rigid and tense condition of the contracted muscle.

The sterno-cleido-mastoid was then described as a large thick muscle passing obliquely across the anterior and lateral part of the neck, being inclosed between two layers of the deep cervical fascia. It has its origin by two heads: from the anterior part of the sternum and sternal third, sometimes half of clavicle, and is inserted in the upper part of mastoid process of the temporal, and external third of superior transverse ridge of occipital bones.

The anatomy of the blood-vessels and nerves closely allied with the sterno-cleido-mastoid muscle was entered into minutely by the doctor, and demonstrated by means of appropriate diagrams, when the patient was etherized, and an operation performed by introducing a tenotome beneath and half an inch above the sternal origin of the involved muscle, dividing it from behind forward, while the head was straightened up so as to put the part upon the stretch.

The puncture was covered by means of a strip of adhesive plaster, when the patient was dismissed, to appear before the class on a succeeding clinic. In the mean time, a splint was adapted that met the indications of the case, a description of which will be given in the next issue, together with his appearance, etc.

Wry-neck, the doctor remarked, dependent, as in this case, on a permanent shortening of the muscle, is most easily and quickly treated by tenotomy; where, on the contrary, the deformity is induced by spasm, of course no operation is to be performed. A rheumatic attack not unfrequently produces torticollis. Cure the rheumatism, and the head straightens of itself. Wry-neck, dependent on disease of the cervical vertebræ, is not uncommon, and it is generally associated with just the

strumous diathesis of this patient. However, I am able to detect no cervical osseous trouble here. In passing the eye, however, down the spinal column, we find most marked lateral curvature; but this, like his wry-neck, has been the result of a loss of proper antagonism in the muscles of the part.

The patient must be built up. We will give him cod-liver oil and some preparations of iron. He must have good diet, and the atonic muscles must be aroused to action by stimulating lotions. Let him rub an ounce of soap liniment into the parts night and morning.

LOCATIONS OF DENTAL DECAY IN 694 CASES,

SHOWING THE RELATIVE LIABILITY OF DIFFERENT TEETH AND THE VARIOUS SURFACES OF THE SAME TEETH TO DECAY.

BY HENRY S. CHASE, M.D., D.D.S.

Upper jaw	450	Right side of under jaw	126
Under jaw	244	Left side of under jaw	118
Right side of upper jaw	231	Right side of face	357
Left side of upper jaw	219	Left side of face	337

	Lateral Surfaces.	Buccal Surfaces.	Lingual Surfaces.	Anterior Approximal.	Posterior Approximal.	Grinding.	Total No. of Cases.
Upper incisors	165	4	8	...	...	...	177
Lateral incisors	61	3	3	...	...	...	70
Central incisors	101	1	5	...	...	...	107
Under incisors	5	...	...	...	...	...	5
Upper canines	28	3	3	...	...	...	34
Under canines	3	...	...	...	...	...	3
Upper bicuspids	...	...	...	38	49	13	100
Under bicuspids	...	5	...	12	22	9	48
Upper molars	...	6	2	33	12	83	146
Under molars	...	28	1	24	24	111	187
Upper 3d molars	...	...	...	...	2	18	20
Under 3d molars	...	9	...	1	...	23	33
Upper 2d molars	...	2	1	5	6	44	58
Upper 1st molars	...	4	1	26	6	31	68
Under 2d molars	...	11	...	7	4	50	78
Under 1st molars	...	8	...	16	20	38	82
Upper 2d bicuspid	...	...	...	20	22	5	49
Upper 1st bicuspid	...	...	...	18	27	8	53
Under 2d bicuspid	...	2	...	6	11	5	24
Under 1st bicuspid	...	3	...	6	11	4	24

These cavities were all in *permanent* teeth, and were all plugged. Whether such statistics are of any practical value I leave the reader to judge for himself.

It is not strange that we find the *first* molars oftener decayed than others, because they are subject to the influences produced by a deranged alimentary canal, so often occurring during the multiplied diseases of children; also to their lax habits of cleanliness. Besides this, too, the food of most American children is wanting in the phosphates to a greater extent than that of older persons, though it should not be.

But how shall we account for the greater frequency of decay on the right side of the mouth than on the left? Tomes' tables show the same result.

Most of the patients for whom these teeth were plugged used the tooth-brush more or less, otherwise there would have been a larger number of *buccal* cavities.

Lingual cavities are rare, in the under jaw especially, owing to cleanliness produced by the tongue, and the anti-fermenting action of the saliva.

Why do the under incisors and cuspids escape so remarkably? The action of the tongue and saliva accounts for a part. Their independence of the deleterious influence of drinks, hot, acidulous, etc., may be another reason. Still it seems to me that these are not *sufficient* reasons, and I do not think of any one that *will* account for it.

DEFECTIVE TEETH OF AMERICANS.

BY ERASTUS WILSON, M.D., HAVANA, CUBA.

In the December number of the Dental Cosmos there is a paper read before the Brooklyn Dental Association. My eye runs over it, and is arrested by the following sentence: "Americans, I am sorry to say, have irregular and comparatively poor teeth—not, as some have supposed, from the effects of climate, for the aborigines were subjected to the same climatic influences, yet had perfect teeth; but rather from *the effects of a mixture of races*, and the artificial mode of life we have adopted."

Now, this quotation includes perhaps nothing of the extraordinary and impossible character so often put forward in these discussions, but still will do for illustration, as it is obnoxious to the complaint, of stating a theory without the slightest attempt at justification, excuse, or apology. Although possessing some knowledge of dental literature, the statement herein contained, viz., that the cause of poor teeth in the United States is "the effect of the mixture of races," is a proposition entirely new to me, as also I think it must be to many others, and, if true, is a fact of the highest significance and interest. But the author has no right to state, in such a positive manner, a proposition so new, without putting us in possession of all the facts upon which it is based.

Those facts, moreover, should amount to a demonstration, else he has violated a fundamental rule in scientific debate, viz., the rule not to allow any statement of theory to go beyond the facts associated with it.

In violating this rule, confusion instead of clearness is the inevitable result, and serves to retard rather than to accelerate our progress. A statement once publicly made, the facts upon which it rests become public property. I therefore ask for them in this case, as being eminently interesting to the profession. What are the data? where, how, and under what circumstances collected? If they are sufficient to establish it, this fact is, so far as I am conversant with the subject, in direct and altogether exceptional contradiction of the rule as established in the mixture of the races in the lower animals—such mixture being a favorite means employed by the farmers to improve the physical condition of their stock.

Now, as to the other cause of poor teeth mentioned in the above quotation, viz., "artificial mode of life," I cannot urge the *same* objection against it. It is not new; on the contrary, it is very old and hackneyed. It is doubtless true, inasmuch as sufficient facts and analogies exist to lend to it at least a strong probability of its truth. I will merely mention one analogy which is well known, and has, I think, been before mentioned in this connection, that in the teeth of neat cattle, as they roam their native pastures, decay is never known, while in their "artificial mode of life," in the swill-milk stables, the teeth suffer the same phenomena of decay as do those of man.

But the objection to the "artificial mode of life" theory, in the present connection, is that it is *thrust in* here with no apparent purpose of utility, as if from mere caprice, and then left to itself, neglected and alone, only serving as an extra text, crowding upon the mind, to distract and divide the attention between a multiplicity of theories—an element of confusion only; while, if properly employed and worked up, it would be a text for discussion of singular interest, and very fruitful in the development of scientific truth. Of what service is it to state theories at all, to those familiar with the same, if it be not for the purpose of introducing facts which tend to confirm, modify, or refute them? It *may* be replied that the paper which I am now criticising was not intended as an argument, but only to *excite* discussion. The answer to that is, waiving the question of propriety, that the paper was not a paper upon this subject, and therefore the objection holds good against it. But enough; my communication, I fear, is extending beyond acceptable limits, and I will not particularize further. My only object is to call attention to what I deem to be our chiefest obstacle, in order that we may concentrate and organize our scientific efforts in view of it. We must particularly organize for developing and diffusing among the profession improved methods of observation and registration of facts; all other requisites for progress will keep pace without effort.

We should devise for the collection of facts statistical schedules for distribution among the profession, with clear and ample instructions how to proceed.

We should, by resolution of our representative bodies, and by direct solicitation, procure that space be provided in the schedules of the next national and State censuses for the collection of facts for our use, such as to enable us to connect dental disease with surrounding conditions, such as climate, soil, diet, temperament, employment, etc.

DEVITALIZING AND REMOVING DENTAL PULPS.

Read before the Brooklyn Dental Association.

BY J. S. LATIMER, D.D.S., NEW YORK.

THE first part of my subject has had so much said and written upon it, and is such an everyday process in our operating rooms, that I cannot expect to advance any new ideas upon it, but shall content myself with a description of the method I commonly practice, with cursory reference to others. Some gentlemen who claim not to require the assistance of arsenious acid—tell us that they uncover the pulp thoroughly, apply creosote, move the pulp from side to side with a hatchet excavator to permit the creosote to work well up to the foramen, then, when the pulp is thoroughly obtunded, they remove it with a broach, and are ready to fill the canal, all within thirty minutes from the uncapping.

Others omit the creosote, and plunge the broach at once, and without notification, into the pulsating pulp. The descriptions of the agony endured, and of the subsequent nervous prostration, have, combined with the golden rule, prevented me from trying this method. When arsenic fails (as it sometimes will) I have tried to obtund the sensibility of the pulp with creosote, chloroform, and tr. aconite separately applied, but have met with very little success. In such cases I have sometimes put the patient under the influence of an anæsthetic, the safest and best I have employed being nitrous oxide.

If Dr. Richardson's method shall come into general use, or shall prove as efficient as it now promises, we shall have little need of arsenious acid. No longer ago than yesterday (July 6th) I examined two teeth in one mouth, against the pulps of which arsenical paste had been plastered for four days, and yet those pulps were as lively as possible, responding to the first attempt to tickle them. I have had them so after several weeks' contact with the destructive agent. Extirpation under the influence of a local or general anæsthetic is the only resort left of which I am aware.

As to my method of applying the paste, I have nothing peculiar. The pulp being fairly exposed and the cavity dried, I take up a small particle of the thick paste on the point of an excavator and carefully plaster it

upon the pulp, then cover with a small pellet of cotton-wool. Next a piece of adhesive wax is melted on one of Wood's pluggers and permitted to run on and saturate the cotton. This I deem far better than sandarac varnish, for the reason that it has no alcohol to dilute the creosote and has no disagreeable taste. Some cover the paste with dry cotton alone, and profess to have results quite as good as with wax or varnish in the cotton. They may be right, but the fear that in mastication the cotton may become displaced and that some of the arsenious acid may be brought in contact with the gum, has so far prevented me from trying it. Besides, I am of the opinion that creosote tends to lessen the pain consequent on the action of arsenic, and hence wish to prevent its dilution by the saliva. If a pellet of cotton saturated with varnish, a plug of wax or gutta-percha, is forced into the cavity over the medicine, it will generally produce pain by pressure, and is liable to force some portion of the medicine out of the cavity and in contact with the gum.

Sometimes a mixture of paraffin and wax will be found preferable to wax alone, as it melts at a much lower temperature. If, from sensibility of the tooth or the fears of the patient, I am unable to fully expose the pulp at first, I excavate as much as possible under the circumstances, apply the medicine, and send the patient away, with the request to call next day, at which time I am able to excavate thoroughly, and apply the medicine to my satisfaction. The arsenious acid is left in the tooth from one to four days, then removed, and the cavity left open to prevent discoloration, though I recently had a superior lateral incisor discolor in spite of all my care.

In from eight to fourteen days I remove the pulp, though I do not often find the dead tissue separated from the living by suppuration, even in two weeks. Generally a little pain follows the application of traction.

Preliminary to the removal of the pulp is cutting away with drill or chisel such portions of the crown as I may deem essential in order to get free access to the roots.

In the cases of the molars and bicuspids this would always include opening through the grinding surface with chisels and drills, while in other teeth the approximal or palatal surfaces are preferred. In any case free access must be had to pass a straight broach into the canal, or we cannot be sure of our operation. This preliminary attended to, we may select a well-cut broach of size corresponding to the supposed caliber of the canal. Thus, for a superior incisor, canine, or the palatal root of a superior molar, the larger instrument will answer a better purpose, but in other canals smaller ones will be required.

In removing pulps from the posterior teeth it will be found convenient to cut off *nearly* all of the handle, and in some cases it may be made even shorter than that, and a globule of sealing-wax melted on to the shaft to assist in rotating it. Broach-holders and long handles are only in the way.

Having selected the broach, dried the cavity, and mopped it with creosote, we pass the broach gently, carefully, and without rotating, as nearly to the apex as possible, and then steadily rotate it three or four times, or until we feel sure it has wound the pulp upon itself, then withdraw. Occasionally you will split the pulp from one extremity to the other; frequently you will fail to get more than a trace of pulp; but you must persevere, take a new broach and try again. Do not cease your efforts to remove the pulp until you are *sure* you have it all, or, at least, have done your very best. I know that even at six and a quarter cents each, broaches are really the most expensive instruments we use when we are faithful to our trust; but we should remember that the benefit of a perfect operation is to accrue mainly to the patient, and that the patient is to pay the expense of time, labor, and material. Economy in broaches is penny wisdom and pound folly. In a large proportion of cases I am unable to remove all the pulp from the canals of the buccal roots of superior molars, and too often I cannot even *find* them. The canals of the anterior roots of inferior molars and those of the first superior bicuspids are often the objects of prolonged and perplexing search. In such cases it is a doubtful expedient to *make* canals with a drill, as some have taught. A better method, to my mind, is to saturate the tooth with creosote, or, which is sometimes more practicable, to place a little dry tannin where canals *ought* to be, and fill immediately. It is consoling to believe that if the canal is so small that we cannot find it, or, finding, cannot introduce a very fine broach, the amount of destructible matter in it is very small, and, even if it should fail to be converted into the tannate or carbolate of albumen, can do but little injury.

A CASE IN DENTAL PHYSIOLOGY.

BY HENRY S. CHASE, M.D., D.D.S., IOWA CITY, IOWA.

Mr. R., aged 18, has all the permanent teeth erupted in the upper jaw excepting the third molars. He retained the right upper *milk* canine until to-day, when I took it out of the gum with my fingers. The root was *entirely* absorbed. His jaw is very large, and the teeth all standing slightly separated from each other. The *permanent canine* stands posterior to the place occupied by the milk canine, in the situation ordinarily holding the first bicuspid. It is evident from the appearance of the teeth, and also from the statement of the patient, that the permanent canine erupted in the exact position where it now stands. Therefore, it has never impinged on the root of the milk canine, which is proof that absorption of the root took place spontaneously, or by a *law* inherent in the living body.

The physiological law of dentition is that *absorption of the roots of*

temporary teeth takes place in the ratio of the advancement of the permanent teeth in the process of eruption, independent of their topographical relations.

The absorption of the milk roots does not take place at a specified age, regardless of this law; for we find milk canines remaining firmly in the jaws in persons forty years old, who have never erupted a *permanent* corresponding canine.

We often see the roots of the milk canines absorbed, and the crowns lost on the piercing of the alveoli and gums by the point of the permanent canines, *far up* on the outside of the alveolar ridge.

Such cases as these and the one at the head of this article should settle conclusively the truth of the law I have stated.

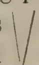
REMOVING TEETH FROM VULCANITE PLATES.

BY W. P. RICE, MOUNT UNION, O.

In the June and December numbers of the Dental Cosmos, I noticed methods of removing teeth from vulcanite plates. I consider the mode I have adopted preferable to either of those, viz.: place the case on a hot stove with the teeth downward, taking care not to let the rubber touch the stove, as it would create an offensive smell. In a few minutes the teeth can be separated from the plate without any danger of breaking. I can see no advantage in heating in dry sand or using oil, as heating well on a stove is certainly less labor, and quite as efficient.

UNION OF MERCURY AND ALUMINIUM.

BY DR. THOMAS H. CHANDLER, BOSTON.

A remark by Dr. McQuillen, in the December number of the Dental Cosmos, on the "Stone-knife," that "the serrations become clogged with gold," reminds me to say that the serrations of our instruments are usually made on a wrong principle. They are made with a fine flat-sided knife-shaped file, thus , instead of with a file with curved sides, thus . The former will always clog, the latter never. While writing, I will mention a very curious effect of mercury on aluminium, which I noticed accidentally some time ago. The books tell us that they will not unite, but I undertook to polish a piece with a buckskin, which had been in use for a long time for squeezing the mercury from amalgam, and was surprised, while holding the aluminium in my hand, to notice a great heat which was developed from it. On looking at it closely, I was still more astonished to perceive a remarkable efflorescence, like the mould on old cheese, springing up and growing visibly to the naked eye. I pursued the experiment for more than an hour, with the same result. Thinking

that perhaps it might be something beside the mercury which induced the result, I took a clean piece of felt, and placed some mercury upon it, wetting it, and breaking up the globules into fine particles with my finger, and rubbing them well in. Upon rubbing the aluminium with this, the same result was again produced. Under a magnifying-glass the effect is very fine. The piece of aluminium which I used was one which had been through the vulcanizer, under Fowler's process. It is just possible that the sulphur may have had something to do with the phenomenon.

PROCEEDINGS OF DENTAL SOCIETIES.

PROCEEDINGS OF THE ODONTOGRAPHIC SOCIETY OF PENNSYLVANIA.

BY THOS. C. STELLWAGEN, D.D.S., A.M.

A MEETING was held Wednesday evening, January 9th, 1867, at the PHILADELPHIA DENTAL COLLEGE building.

Prof. Jas. E. Garretson in the chair.

After the reading and adoption of the minutes of the last meeting it was made known by Prof. McQuillen that in response to an invitation on his part, Prof. Hayden, of the University of Pennsylvania, was present, and therefore moved that he be requested to address the Society upon the Geology of that most interesting section of country comprised in Nebraska and Dakota Territories, which he had found to be so eminently rich in fossil remains; in illustration of which a large number of valuable specimens of fossil teeth, skulls of animals, turtles, shells, etc., collected by him in that region, were on the table. It was due to the gentleman to state that he enjoyed the distinguished honor of being the first to discover the fossil remains of horses in North America, along with other animals not observed here before by geologists. It had been generally supposed that, prior to the advent of the Spaniards, horses had not existed in the Western Hemisphere, but the researches of Darwin in South America, and Hayden in our own country, fully demonstrate their presence ages back.

The motion having prevailed, Prof. Hayden made some remarks in regard to the simplicity of the geological structure of that portion of the far West drained by the Missouri River and its tributaries. He called the attention of the Society more especially to the existence of several great fresh water lakes along the eastern slope of the Rocky Mountains during the Tertiary Period. The lake basins are remarkable for the large number of well preserved mammalian fossils which had been entombed in their strata. But in order that the relations of the Tertiary lake basins to the surrounding formations could be better understood,

it might be well to present a brief resumé of the geological structure of the whole region. To illustrate this a large geological map of that region was used.

The rocks of the different great periods seemed to lie in basins. By referring to the map, it would be seen that the coal-bearing rocks are largely developed along the Missouri River, from a point below the mouth of the Kansas, at Leavenworth City, Nebraska City, and other places; but that by a slight dip toward the northwest, they pass beneath the water level of the river about thirty miles above Council Bluffs. Here rocks do not appear again in their westward extension until they are revealed by the upheaval of the Rocky Mountains and their outlines, the Black Hills, etc. They are here exposed by upheaval with a comparatively diminished thickness, varying from 200 to 1500 feet, forming a narrow belt or zone around the granitic nucleus. Overlying the carboniferous rocks along the Missouri, are a series of formations of cretaceous age, which had been separated on Paleontological and Stratagraphical grounds into five divisions—Nos. 1, 2, 3, 4, and 5. Beds of intermediate age are wanting in this region. All these divisions gradually dip beneath the water level of the river as we ascend, but reappear along the slope of the mountains, showing quite clearly that they lie beneath the Tertiary beds in the basin-like form before alluded to.

Then come the great Tertiary basins, which may be given in the order of their supposed age, commencing with the oldest: 1st, the Judith River Basin occupies an area of about forty miles in length from east to west, and fifteen to twenty from north to south; 2d, the Great Lignite Basin occupies all the country from Heart River to the Mussel Shell, most of the Valley of the Yellow Stone, extends for an unknown distance northward, at least to the North Platte, and it is supposed that the Lignite Beds near Pike's Peak and Baton Pass, in New Mexico, are of the same age: the limits of this great basin have not yet been strictly defined; 3d, the Wind River deposits occupy an area of about one hundred miles in length, and about forty to fifty in width: they are situated between the Wind River and the Big Horn Mountains; 4th, the Basin of the "Mauvaises Terres" or Bad Lands of White River, more properly called Washed Lands, cover a vast region, at least one hundred thousand square miles, and from the scattered hills on both sides of the Missouri River, this great fresh water lake must have spread over an area of one hundred and fifty thousand square miles. This region has received the name of Bad Lands because it is so cut and gashed into canons by the erosive action of water, that it is almost inaccessible to travelers. It is supposed, from the evidence already secured, that these lakes were not cotemporaneous, but succeeded each other in the order enumerated.

Although all these basins contain fossils of a very interesting character, yet it is entombed in the strata of the third basin that we find the most

remarkable organic remains that have ever met the eye of the comparative anatomist in this country. Among the Pachyderms was a species of *Hippopotamus* or immense sea-hog. A *Titanatherium*, which was closely allied to, but larger than the *Palaeotherium* described by Cuvier from the Paris basin, three species of Rhinoceros, one of which had almost the same size and formula of dentition as the recent Indian rhinoceros (*R. Indicus*), the second about three-fourths as large, and the third species about half as large as the *R. Indicus*. The teeth are most perfectly preserved, and do not differ materially, except in size, from those of the recent animal. Here was also eight species of the Horse tribe, one of which must have been about the size of our large cart horse. The others were smaller, though of various sizes, from the common horse down to the size of a common dog. Here were also three species of Camels, to which Prof. Leidy has given the name of *Procamelus;* one of them was about the size of our common Bactrian camel. Prof. Leidy in describing this species says: "Six molar teeth form a closed row in the lower jaw, being two additional to the number in the camel or lama; the true molars and the last premolar have nearly the same form as the corresponding teeth of the camel. The second premolar is a reduced one from that behind it; and the first premolar has a laterally compressed ovate crown implanted by two fangs." Here are also six molar teeth forming a closed row in the upper jaw, and all seem to possess much the same form as those of our recent camel. A second species occurs in this formation about two-thirds the size of our recent camel. A third species about the size of the South American lama.

Of the Carnivora there were four canine and two feline animals. One of them was a wolf, larger than any living species, and another was a small species of fox. Here were also among the Rodents or gnawers a rabbit, two small species of beaver, a porcupine, and several mice; also two or three species of deer; a small species of mastodon, differing from any before discovered in the later formations of this country; and an elephant, a third larger than any ever before known, extinct or recent. Much more might be said in regard to this wonderful Fauna, but it must be deferred to a subsequent occasion.

The vegetable remains of the Lower Cretaceous formation of this region are peculiarly interesting to the geologist from the fact that among them are forms so closely resembling the leaves of the fruit and forest trees of the present time—a very marked and important advance in the progress of the vegetation of the ancient world. So far as can be seen from the collections already made, they do not seem to exhibit as high a type of organization as those of the same class of the present day. There seem to be no serrations on the edges of the leaves or other attempts at ornamentation, which are so finely shown in those of our living forest trees.

The inference is, therefore, that this Flora illustrates the great law of progress; commencing with great simplicity of form, and advancing, step by step, to greater complexity and beauty.

Prof. H. also spoke of the interesting fossil shells he had collected during the past season from the Fort Pierre group, at Sage Creek, and other localities in that vicinity. These fossils are so abundant at certain localities, extending in continuous lines or belts for long distances across the country, and so well preserved, that one might regard these shell-zones as the shores of the great Cretaceous Sea. He also exhibited some thin slabs of fine-grained ferruginous sandstone, from the head waters of the Teton River, eastern side of the Bad Lands. They belong to the upper part of the Fox Hills group, near the close of the Cretaceous period of the Upper Missouri. They were covered with very distinct trails of gasteropoda and marine worms. These specimens seem to indicate a shore-line, from which there was an ebb and flow of the tide, and as the waters receded, these little animals, left behind, would struggle over the soft sand toward the water, leaving their peculiar trails, which would be filled up with sediment by the returning tide.

The fact of the existence of four and perhaps five great fresh water lakes in the Upper Missouri country during the Tertiary period, is a matter of the highest interest, and it is our privilege to collect all the evidence possible, and thus restore to our minds the ancient physical geography of this region. We cannot doubt that during all the different geological epochs there were lakes, rivers, seas, and oceans, islands, continents, and mountains; and that it is the most important mission of the geologist to restore the physical geography of these different epochs to the eye of science.

Prof. McQuillen remarked that it must be evident to every one present that the subject was one of decided interest to the dental profession, and he would again take occasion to reiterate what he had said on former occasions, and now perhaps, with these specimens before them speaking with more emphasis, and with greater probability of arresting the attention of those who should be made aware of its importance, that the teeth, on account of their *durability* and *characteristic* forms, are among the most important aids in determining the species, habits, etc. of extinct animals, and this was not only true of the external configuration, but also of the internal structure as viewed under the microscope. Important geological questions, sometimes involving large pecuniary interest, determining, for instance, the presence or absence of coal beds, had in this way been settled in the most satisfactory and unquestionable manner.

Within a short period, a naturalist of some prominence in the Philadelphia Academy of Natural Sciences had placed in his hands for microscopical examination a fossil specimen (which was exhibited to the members) that the gentleman regarded as the tooth of the *Labyrinthodon*, an

extinct gigantic Batrachian first described by Owen, and so named on account of the labyrinthine arrangement of the enamel, dentine, and cementum. Not having had an opportunity as yet to make a microscopical section, he did not feel prepared to offer any opinion with regard to it. The specimen, which is fragmentary and imbedded in a matrix of ferruginous sandstone, was obtained from an excavation near Phœnixville, Pa.

While thus desirous of awaking an interest in this direction on the part of students and practitioners of dentistry, that by an intimate and extended acquaintance with the comparative anatomy of the teeth they may be able to aid the investigation of the geologist and paleontologist, his principal object in rising was to move a vote of thanks to Prof. Hayden for his interesting and instructive address.

This motion was carried unanimously with an amendment by Dr. Stellwagen, that at some future time, when convenient to himself, the gentleman should continue the subject.

Prof. Morgan, in rising by invitation, desired to call attention to the efforts of Prof. Hayden to popularize his favorite science. Last spring, he had the pleasure of attending his regular course, and was much impressed by the fact that he then extended a cordial invitation to any who were unable to incur the expense, but were willing to give their time for the purpose, to attend the course, free. The public should certainly appreciate such a deviation from the exclusiveness so common in the walks of science.

He had this evening directed attention to one or two points on which the whole fabric of geology rests, to wit: the *chronology* of the rocks, as determined by the organic remains which lie buried in them; identical species are confined to the same age. Many persons imagine that a knowledge of an interminable list of minerals constitute a knowledge of geology, and are therefore deterred from its study; but it is evident that mineralogy is an entirely distinct subject, or nearly so, and that, as Prof. McQuillen has remarked, a few teeth of an extinct reptile may have more significance and value, in determining the possibility of underlying coal beds of an earlier date in the geological history, than a whole cabinet of minerals, however interesting from a chemical point of view, although a knowledge of mineralogy is undoubtedly facilitated by a previous study of the geological order of the strata in which they are found.

At the conclusion of the remarks, the specimens were carefully examined, and elicited many expressions of pleasure at the rare treat thus afforded to the members and visitors present.

Prof. Leeds then exhibited and described an apparatus which he has had constructed with the view of demonstrating the precipitation of chemical compounds to a large class of students.

The attention of the Society was directed by Dr. Stellwagen to an ad-

ditional convenience applied to the spray producer for dental purposes, the invention of an English practitioner; the instrument was exhibited with the attachment, and pronounced by all present to have the appearance of answering the purpose required, namely: to hold the soft parts of the mouth away from the jets (for description, see DENTAL COSMOS of January, 1867).

Prof. Foote said he had used the ethereal spray in many cases both of dental and minor surgical operations, and could testify in the highest manner to its merits.

The Society then adjourned.

BROOKLYN DENTAL ASSOCIATION.

BY W. C. HORNE.

November 28.

THE Brooklyn Dental Association met at Dr. Marvin's.

Dr. W. H. Atkinson read a paper on Histology, and Dr. C. E. Latimer one, as follows, on

DECALCIFIED TEETH.

Mr. President and Gentlemen:—I am not aware that I can offer anything particularly new or striking upon the subject of the evening, and would not presume to write upon it, but from the fact of having been appointed to do so, and even a poor paper will serve as an introduction to the subject, when it will be ably handled by men who have much the advantage of me in knowledge and experience.

I shall not enter into speculations in regard to the causes which produce "chalky teeth," as they are often denominated, but merely make a few general statements and then devote my attention to the more practical questions which arise in everyday practice. A short time since we had a member in our society who held that this class of teeth was lacking, *not* in the mineral elements, having the usual amount of these, but rather in the animal matter necessary to hold them together; but as I am not aware that any one now present entertains this idea, I shall not stop to discuss it.

It is somewhat surprising that authors and writers agree so nearly as to the proportion of elementary substances entering into the composition of the teeth, when we all know that this proportion is changing every day, and that it would be exceedingly difficult if not impossible to find teeth with the same proportion of elements, even among those of the same age. I can account for this uniformity of teaching only upon the supposition that writers content themselves with copying from one or two old authorities without verifying their statements by analysis of their

own. With a view of demonstrating the great difference in various teeth, I selected two corresponding teeth of the same age, both equally dried and of equal weight, then by burning out the organic elements, I found a loss of four grains more in one tooth than in the other.

A second experiment showed a loss of four and one-half grains more in the chalky tooth than in one better calcified. For the third test I selected two teeth, each weighing one dwt., equally dried, but as different as possible in density. After burning them I found that one had lost nine grains in weight while the other had lost but three. Other experiments were tried, showing a loss in the organic constituents of from three to ten grains per tooth. While there is this difference, how absurd it would be to analyze one tooth and make that the rule for all others! Better select a great number of teeth of different ages and degrees of density, then the analysis would show an average proportion of the elementary constituents. Even then a different selection would give a different result.

A question might arise in this connection, how far must calcification have progressed in a tooth to bring it within the bounds of a physiological condition? It will be remembered by some now present that an animated discussion arose upon this point at the last meeting of the American Dental Association, at Boston, one party claiming that a *growing* tooth was in a *pathological* condition. Now with all due deference to older and wiser heads than mine, I must hold that because calcification is progressing in a tooth it does not therefore follow that the tooth is in a pathological condition, but rather the reverse, whether deciduous or permanent. Indeed, we are all aware that the deposition of the inorganic elements, consisting principally of the phosphate of lime, in the dentinal tubuli and walls of the pulp cavity continues during life, and if these are in a pathological condition, then must we look for dead teeth when we would see the physiological. But enough upon this point. I trust the fault is more in our nomenclature than in the heads or hearts of my brethren.

There is great discrepancy in the estimated diameter of the dentinal tubuli as given by different authorities. This I attribute, as above, to the difference in the teeth examined more than in the apprehension or methods of measurement of the different persons.

Professor Retzius, of Stockholm, for instance, gives the diameter of these tubes at ·000216+ of an inch; other authorities make them much smaller, while a writer in the November number of the DENTAL COSMOS gives still another estimate. Without doubt all measured correctly the specimens which they had, while other sections would give still different results.

I have here some specimens which I will exhibit, showing the ossific deposit as it progresses in the inferior molars, changing the two origi-

nally large pulp canals into three, then four continually-diminishing ones, until, in old age, they are almost obliterated and the tooth becomes exceedingly hard and brittle from excess of the lime salts—a counterpart of the change that takes place in the whole osseous system.

I present also some samples of what many would denominate inflammation of the dentine, while others would demur at the term, claiming that inflammation cannot exist in bone; but however this may be, here we have, to all appearance, the red globules of the blood, probably broken up, and infiltrating the dental tubuli.

Exactly how much may be done to correct the unbalanced proportion of organic and inorganic elements in teeth before and after they are developed, is not yet known, but it is an interesting and profitable field for investigation, which I hope every one will profit by; then, by bringing the experience of all together and comparing notes we may arrive at something definite, which shall be of the utmost importance to suffering humanity. Not that we can grow new enamel on old teeth as was claimed by a member of the American Dental Convention, but perhaps we may secure hard, sound dentine in place of the imperfect tissue we often have to deal with.

When Mr. Layard, the celebrated traveler, was exploring the ancient City of Nineveh, he exhumed and sent to England some very curious specimens of beautifully carved ivory; when they reached England, however, and the boxes were opened, they were found to be crumbling to pieces. In this dilemma, Professor Owen was called, who said, "let them be boiled in gelatine, 'tis that which they have lost." This was done and the specimens were found as hard as when first carved, and likely to last another thousand years.

Those of you who saw the famous mastodon at Dr. Warren's Museum, in Boston, with his set of artificial teeth or tusks, and saw the crumbling mementoes of the original in the glass-covered box, may have been reminded of Professor Owen's advice. But as we cannot introduce the needed materials from the external surfaces of the teeth, we must endeavor to do so through the medium of the circulation.

That much may be done to improve the character of the teeth by the administration of the different preparations of lime in either the food or drinks, I am convinced by experiments which I have tried.

Dr. E. C. Francis presented some lozenges to this society some time ago which were prepared at his request, incorporating the phosphate of lime with candy so as to make them palatable to children. I experimented, to some extent, in this direction, using, besides the phosphate of lime, some of the preparations of iron employed as tonics, to assist in the assimilation of the lime. I doubt not a judicious use of these lozenges would prove of great benefit if employed during the formation and even after the development of the teeth. There must, however, always be this

objection to all such preparations, that the sugar employed is rarely rinsed from the mouth, but allowed to remain between the teeth, where it produces fermentation in connection with the particles of food which are always present, thereby eliminating acetic acid, and tending to produce caries. This trouble arises, however, from the common but improper method of using the lozenges, and is not justly chargeable to the ingredients when used as they should be. It is very important for the preservation of the teeth and tone of the stomach, that all persons, and especially children, should acquire the habit of eating only at regular intervals, and of brushing the teeth, or at least rinsing the mouth thoroughly afterward, using some alkaline powder or wash to neutralize any acid that may have been used in the food, and preventing fermentation by removing the food as completely as possible from the teeth, and supplying an excess of alkali. I would not wish to undervalue the importance of *Nature's* method of developing sound dentals — plenty of healthful exercise in pure air as a tonic, and an abundant supply of the mineral phosphates in the food, so prepared as to necessitate a vigorous use of the muscles of the jaws, thereby developing broad, strong jaws, which shall furnish room for an even row of sound teeth. These points I consider of the utmost importance, and we should, just so far as is possible with our artificial mode of living, both by precept and example, give our influence in favor of a much-needed reform in this direction. However, as this subject has an able and persistent advocate in our society in the person of Dr. John Allen, I need not further dwell upon it here.

I am not aware that my practice differs from that ordinarily pursued in filling the deciduous teeth. The materials preferred are gold for small or ordinary cavities, except where less expensive work is specially desired, when Lawrence's amalgam is substituted, and Hill's stopping for deep ones; bearing in mind that neither these teeth nor the young six-year molars will tolerate metal near their pulps.

We may usually expect trouble with the deciduous molars while the six-year molars are coming through, and with *them*, in turn, while the second bicuspids and second molars are erupting. In several instances I have filled the six-year molars, and had them remain perfectly satisfactory until the inflammation caused by the eruption of an adjoining tooth would create so much trouble as to necessitate devitalizing the pulp, so that in such cases I now prefer filling the cavities, unless small, with Hill's stopping until the adjoining teeth shall have made their appearance. One objection to this plan is that patients are too liable to neglect attending to it in season; then, when the temporary filling shall fail, they blame their dentist as much as though a gold filling had come out.

I recollect applying some oxychloride of zinc to a superficial decay to

obtund the sensibility that I might excavate it, but the patient not keeping the appointment, met me several weeks afterward coming out of church, with this remark, loud enough to be heard by all around, "Doctor, the filling that you put in my tooth the other day has all come out."

I did not stop to thank him for advertising me in such a public manner. To obviate this difficulty, I am now careful to call all such temporary fillings *medicine* or *packing*.

Inasmuch as prevention is better than cure, I think it very desirable to fill up the deep depressions between the cusps of molars where food is so liable to lodge, and as soon as a slight black line shows that caries has commenced, I cut it out, make retaining-points, and fill up all these grooves. In many cases the enamel of these chalky teeth seems to be so imperfectly crystallized in the depressions between the cusps of the six-year molars, that there is found a line approaching more nearly the consistency of cartilage than enamel. These teeth should receive the same treatment as those just mentioned.

The less surface exposed to the action of external agents, the safer is the tooth.

Indeed, I have the frail teeth of children presented nearly every day, and feel that before linking my name and reputation with them, I would wish to have them incased in gold or pickled in alcohol; then only could I pronounce them safe from caries. When filling young teeth we must bear in mind their frailty, and not trust a filling to slight supports and retaining-points as we would in older teeth, but obtain thick, strong walls, if possible, remembering that these teeth are exceedingly deceitful, often appearing much stronger than they really are.

Filling a tooth is but one step toward saving it, especially if it belongs to the class under consideration; and this fact should be impressed upon the mind of the patient, together with the additional important fact that the teeth should be kept clean with a brush and chalk, or its equivalent, alkali, otherwise they will be quite sure to fail.

Dr. J. M. Crowell presented specimens of porcelain teeth, the results of his own experiments, of great strength and beauty, and in excellent imitation of the natural organs.

December 12.

The Association met at Dr. Atkinson's. The subject of discussion being Filling Teeth by the Mallet.

Dr. Marvin having been appointed essayist, presented a paper of which the following is a synopsis: He said that the time had gone by when the stuffing of gold, tin, or some plastic substance into a tooth might be called filling. There was a period when the highest evidence of excellence in a filling was the confident assertion of the operator that it would

"stay;" how long was quite another question; if a whole year it was deemed a remarkable success; and when a dentist could be found who was ready to warrant his work for a year he was considered by the public worthy of great confidence, while he felt that he was doing a very hazardous thing.

In our profession such advances have been made, such means of improvement placed within the reach of all, that ignorance is no longer a misfortune, it is a fault. Taking as its motive principle the idea that a natural dental organ is superior to an artificial one, this branch of our art has been impelled to the rescue from destruction and restoration to usefulness of teeth almost wholly under the power of disease. This advance necessitated not only increased mental, but also increased physical labor. Machines and ingenious methods are devised by the mind to save the body pain and labor. Thus the mallet was born to secure better results at a much less expense of labor. Does it secure these ends? Assuredly it does. The more densely gold is packed, the better is the filling, and this for obvious reasons. Impaction is more effective than steady pressure. A sudden stroke with a light hammer produces a far greater impression than superior force applied steadily. You may bear very heavily upon a nail, without making it advance the thickness of a hair into the plank, but with a fraction of the weight applied by impaction, the nail is made to enter without difficulty. This is just the advantage of the mallet. By a light stroke, not of necessity painful to the patient, the gold is securely inserted in its place, and the largest operation of "building up" carried through to a successful completion; and when it is finished (if properly done), the operator and patient may feel a degree of confidence in its durability which afford great satisfaction. Another advantage is, that the packing of the filling may be accomplished in places, where from awkwardness of position, but little pressure could be applied with the hand. In such instances the plugging instrument has only to be turned in the proper direction and the mallet applied, and the gold is condensed as thoroughly as in any other part of the tooth. The operator too being relieved from the necessity of applying the force, can give his whole thought to the insertion of the gold, and be prepared at any moment to meet any obstacle that may arise. Relieved of the fear of a slipping instrument when working near a fragile wall or an inflamed gum, he lays his gold on with a bold hand, and sees it thoroughly impacted at the edge and extreme border, as well as at the base or within the walls of the cavity.

There is one great objection to the use of the mallet: it is this—an assistant is required. His idea of a dental office was that it should be private, neat, inviting, with as few indications of business visible as possible. The unrestricted entrance and departure of assistants or others,

general conversation, and any unnecessary noise were at variance with that quietness and absence from confusion which should prevail.

These considerations and some others had led to another advance, the invention of the "Automatic Plugger." This gives the entire control of the operation to the operator, enables him to take all the time he requires in placing his gold and his instrument before the blow is given, removes all apprehension of accident from a too sudden or too severe stroke, and all impatience when one is delayed. It had been said of this instrument, as an objection, that "It has no brains:" this instead of an objection, he considered a virtue. One brain and one alone is all that can be employed to advantage upon one operation. The more entirely all the appliances used are under the control of the dentist the better. As to the instrument itself, much improvement remains yet to be made.

Without attempting to speak of the comparative efficiency of those already introduced, it would be sufficient to say that with each new attempt something seems to have been gained, and we may confidently look for an instrument yet to be invented which shall meet all the wants of the case, at no distant day.

What we need is evenness and directness of stroke, the application of the impactive force just when we wish it, the power of increasing or diminishing that force while using the instrument, and the easy removal of the points, and yet their perfect firmness when in the plugger. When such an instrument has been made, and dentists so far forget their old notions and old prejudices as to use it carefully and well, we shall have reached another era in the history of our profession, which we may call the era of perfect tooth filling.

Drs. Fitch and Atkinson united in their appreciation of mallet filling in preference to any other method on account of its social advantages.

Other members gave more or less qualified indorsements to various automatic pluggers, all agreeing that they did not yet perfectly supply the place of the mallet and assistant.

Stereoscopic views were presented of a case of restoration by artificial substitute of the upper teeth and maxillary from the dens sapientia on the right to the second molar on the left. It was further complicated by an opening into the antrum, through which a finger might be thrust. The necrosis of the parts was due to extensive abscess, originating with diseased teeth several years since. After surgical operation by Dr. J. M. Carnochan, the patient had passed into the hands of Dr. G. H. Perine, by whom the restoration of the sunken features was very nicely effected.

The Society passed a vote of congratulation to Dr. Perine for his success in the operation.

December 26.

The Association met at Dr. Fitch's.

After the usual routine business, a committee, consisting of Drs. Atkinson, Horne, and Mills, was appointed to procure the incorporation of the Association.

A committee, consisting of Drs. Latimer, Atkinson, and Varney, was appointed to procure a microscope for use at meetings of the Society.

The subject for discussion being Dental Medicines, Dr. I. Lyon reported the use of ether spray on sensitive dentine with such effect that he unconsciously penetrated to the pulp cavity in excavating. A further application was then made to the pulp, and it was removed with very little pain to the patient.

Dr. Atkinson remarked that we often get into trouble by working fearlessly, when we should move very tenderly. This freezing process should be conducted carefully and deliberately, when the red globules would be driven out of the capillaries, and leave the gums blanched. Where the freezing was induced too rapidly, the gums became redder. Among the most useful dental medicines were the "polychrests" which he had announced to the profession. These needed to be delicately handled. He had been abused for recommending chromic acid, while the trouble all lay in not applying it directly to the sensitive point where it was needed, but allowing it to get upon the gums and enamel. He had now to announce a new remedy, glacial acetic acid in the proportions of nine parts to one of pure creosote on sloughing surfaces, and three to one for fungous growths and hæmorrhagic condition of gums. Great care should be observed not to put it where it was not wanted: it makes a clean sweep of all morbid growths; removing cancerous tissues. In cases of osteal cysts of the maxillary bones, he fills the cavity with cotton saturated with the solution in the last named proportions.

Iodine is one of our chief remedies; in epulis, providing it was really what that word indicates, a cure would be effected in a short time by painting the gums with a saturated solution of pure iodine in alcohol, being careful to interpose a layer of paper between the gum and the lip, there being a peculiar tolerance of iodine in the gum which was not found in the lip.

Dr. J. S. Latimer had found several cases of teeth that had been bleached in which the dark hue returned. He desired an expression of opinion upon the methods of bleaching, and their results.

Dr. Horne commonly used the chloride of lime for bleaching discolored teeth, and found very great difference in the time required for the operation, varying from a few days to weeks. The greatest difficulty was found in restoring that part of the crown near the gum to its natural color. He endeavored to carry the bleaching so far as to attain a color lighter than

that of the contiguous teeth, as that allowed for some return to the former discoloration, which in his experience always occurred. The use of bone filling or of Hill's stopping to preserve the color of the tooth, they being hermetically sealed up by gold, had proved of great advantage to him. The subsequent discoloration spoken of was perhaps due to infiltration through the tubules at the neck, which had not been cut across.

Dr. Fitch said that he had experimented with a number of bleaching agents, and found the chloride of lime least prejudicial; but he had no great opinion of bleaching: he preferred to clean the teeth thoroughly and introduce some material which would as nearly as possible restore the tooth to its natural color.

Dr. Perine referred to a central incisor which he had that day seen, filled twenty-five years ago; a thin coating of plaster of Paris had been introduced upon the inner surface of the labial wall of the enamel, and with so good an effect that the difference in color from its neighbor could only be discovered by a practiced eye. He confirmed the usefulness of the preparation of iodine and creosote recommended by Dr. Atkinson.

Dr. C. E. Latimer referred to a statement of Dr. Watts, that teeth could not be bleached after tannin and creosote had been used in them. He did not agree with that opinion. He suggested the possibility of bleaching with ivory-black.

Dr. Fitch said there was no chemical action whatever in bone-black, it was purely mechanical—retaining coloring matter and gases held in solution by the liquid passing through it.

Dr. C. E. Latimer, continuing, said that success in bleaching was much more certain in young teeth, in which the tubuli were large, than in old teeth, which it was very difficult to affect.

Dr. J. S. Latimer found that leaving the cavity of the discolored tooth open, after it had been excavated, would in a few days occasion a perceptible improvement in its color.

Dr. Atkinson said, any tooth could be bleached with crystals of chloride of zinc, washing carefully after each application.

Dr. McManus, of Hartford, had seen teeth from the hands of operators who freely used Labarraque's solution, the walls of which very soon broke down. He preferred to use plaster or a layer of paper for improving the color, and had done so very successfully.

Dr. Bronson had found chloride of lime produce the singular effect of turning a central incisor yellow to which it was applied. He found asbestos moistened with carbolic acid the best thing he ever used for sensitive dentine, to be covered with gutta-percha. In two cases, being in doubt whether or not there was exposure of the pulp, he had applied carbolic acid, and on removing it in a few days, had a flow of blood from the pulp.

ILLINOIS STATE DENTAL SOCIETY.

The third regular session of the Illinois State Dental Society was held in Chicago in the lecture room of the First Methodist Church on the 13th of November, 1866.

The meeting was called to order by the president, Dr. H. N. Lewis, of Quincy.

The first business in order was the reading of an address by Dr. M. S. Dean, of Chicago.

The speaker, after a brief introduction to his remarks, spoke at some length of the progress made by the profession during the last few years. No better proof of this progress could be had than a comparison between the mechanical work of the past with that of the present. The clumsily carved blocks of ivory which, a few years ago, served the purpose of teeth, and though infinitely inferior to the work of the merest tyro in the profession of to-day, were even in the present generation considered to embody all the skill and art possessed by members of the profession. One of the main, though probably indirect, causes of this advancement was the fact that a change of climate, and the replacement of the simple diet of by-gone days by the luxurious viands of recent times, had called the labors of the dentist into more general requisition, causing him to embrace every opportunity for improvement. But even appreciating the great progress which has been made, there is still a call for an increased display of energy and ability. Great good would be achieved by the erection of a higher standard of education. The profession required as extensive a course of study as medicine and surgery. It must improve all the aids that science affords. The education of the student should be substantial in its nature and threefold in its character, embracing the instruction of the mind, the hand, and the eye. That is, it should be scientific, mechanical, and artistic. The whole system should be well known by the practitioner, inasmuch as a knowledge of the entire system is requisite for the successful treatment of any of its principal organs. A certain acquaintance with medicine should therefore be the groundwork of the profession. The hand of the dentist should be trained in the mechanics of the profession, and in the handling of instruments dextrously. It must construct well and readily what the mind conceives. The eye, by education, must be rendered acute and delicate. In noticing the general and satisfactory progress of the profession, it was observable that during the past four or five years that advancement had not been as general as during the five years immediately preceding. This was probably owing to the fact, that the introduction of vulcanized rubber as a base caused the work of inserting teeth to be conducted so cheaply that the onward progress of

the profession was somewhat checked. It was satisfactory to witness that to this general rule there were honorable exceptions, and that many members have continued to devote their best talents to the advancement of this important branch of surgery.

In conclusion, Dr. Dean spoke of the benefits arising from such associations as the Illinois State Dental Society. They were useful because they afforded opportunities for an interchange of ideas. Those who fail to avail themselves of the advantages of such comparative knowledge, will find that in a short time they will be outstripped by others who commenced with a smaller scientific foundation, but who have acquired knowledge from the experiences of older members of the profession. To bring about this good the Illinois Society was established, and, in considering the benefits which will accrue from a free and full interchange of experiences and ideas, its members should relate their respective practices, their successes, and, if they have any, their failures. While the dentist should study to become eminently useful in his profession, he must not neglect the collateral sciences. There is a great danger that in the everyday routine the cramped mind will become confined to its narrow limits, and lose the rich and mellow fruit of science and literature.

A vote of thanks was tendered to Dr. Dean for the able and instructive address he had delivered to the Association.

The following gentlemen were balloted for and duly elected members:

Drs. I. D. Kilbourne, of Chicago; V. R. David, of Sandwich; S. Abbott, of Wilmington; S. M. Swain, of Aurora; T. F. Woodbridge, of Mendota; George Salter, of Joliet.

The Society then adjourned until 3 o'clock in the afternoon.

Afternoon Session.

The Society met in the afternoon, pursuant to adjournment.

As a commencement of the regular discussion of the meeting, Dr. J. Ward Ellis spoke at some length on the necessity of elevating the dental profession. That profession was but a new one, but it had acquired the position of a distinct branch, and was regarded by the public as one of importance. The confidence reposed in it by the people must not be abused by the profession. Dentists needed to cultivate a higher order of education. A man must not expect to leave the mechanic's bench and commence the practice of dentistry with no further aid than that afforded by a manual on the subject. He must know that the highest qualifications are necessary, and then when he feels competent in his profession he must set his mark high. Every man should aim to excel in operation rather than attempt to compete with others in the matter of low prices. This subject of competition might have been entertained twenty years ago, but it cannot now, and the man who does his work best will be the man who succeeds. Even now the popular mind has not

become sufficiently schooled to fully recognize the merits of dentistry; but, in a measure, this is, perhaps, one of the faults of the practitioner, and would be obviated in a great measure if all attempt to elevate the profession rather than to build up individual practices at the expense of the reputation of some brother practitioner. In conclusion, the speaker dwelt upon the necessity of honesty of sentiment. What a man does not know he should acknowledge boldly, rather than attempt to make some reply which can never be satisfactory, and which will frequently only prove injurious to the practitioner.

Dr. Cushing, of Chicago, next read an essay upon the causes and prevention of diseases of the teeth. He defined the diseases to be of two characters—predisposing and exciting. To fully discuss the first class of diseases, the investigator must go back to the period of gestation. Without taking into consideration the theory of hereditary transmission, it was a fact well established that the health of the mother during the period of pregnancy has a great effect upon the health of the child.

The want of proper nourishment on the part of the parent at this time is much felt by the unborn child, and in no organs more perceptibly than in the dental ones. Predisposing causes may also occur after dentition has been completed. Every depraved condition of the system will exercise its influence more or less upon the teeth. The exciting causes of disease may be considered as mainly attributable to the action of acids. These, by the exercise of a chemical action upon the teeth, destroy their structure.

In speaking of the means of prevention, the speaker said that the prevention of the predisposing forms of disease rests, in a great measure, with the mother of the unborn infant. Mothers cannot place too much value upon the necessity, during pregnancy, of having a proper diet—especially food rich in the bone-making material—and in taking suitable exercise.

The reason why the teeth of people of later days are more decayed than were those of past generations is that we are now farther from nature's simple plan. Indeed, the terrible condition of the present generation may be said to be one of the penalties of civilization, and the decayed condition will increase in exact ratio with the luxuriousness of the diet. Dentists should discourage the general use of pickles, lemons, and other acid substances, and bring their patients as nearly as possible under the influence of the hygienic law. Another great cause of disease by the production of acids, is the fermentation of food lodging in the teeth after eating. The remedy for and preventive of this is cleanliness, absolute cleanliness. The doctor recommended the use of antacids with the brush. Solution of carbonate of soda, lime-water, etc. could be advantageously used three times a day, for an indefinite period.

After some discussion upon Dr. Cushing's able essay, the Society adjourned.

MARYLAND ASSOCIATION OF DENTISTS.

A SERIES of preliminary meetings, held during the summer of 1866 in the City of Baltimore, resulted in the formation of a Dental Association for the State of Maryland.

Dr. Robert Arthur, who bore an active and influential part in all the preliminary meetings, was chosen president of the association, and the first regular meeting was held at the residence of the president on the evening of the 25th of October, 1866.

No special subject being before the society, the evening of the first regular meeting was spent in an *impromptu* discussion of points in dental practice having reference chiefly to the duties of dentists in the preservation of the natural teeth.

Drs. Volck, Arthur, Williams, Fouke, Bean, McDowell, and H. H. Keech bore part in the discussions of the evening.

Dr. Adalbert Volck had reason to believe that "*arsenic*" was abused in the hands of some, and thought the society might be instrumental in doing the public a valuable service by supplying means whereby patients could be made acquainted with the nature of this powerful agent. In order to afford the doctor opportunity to develop his views and plans upon the subject, a resolution was passed requesting Dr. Volck to present, at the November meeting, "Suggestions for popular guidance in the use and abuse of arsenious acid in the treatment of teeth."

The second regular meeting of the society was convened at the residence of Prof. H. H. Keech, on the evening of the 30th of November. At this meeting the society took what was deemed appropriate action upon the claims made upon the dental profession by the Goodyear Dental Vulcanite Company, *resolving* to canvass the City of Baltimore and the State of Maryland to raise funds to aid in having a final decision of the question in the Supreme Court of the United States.

"Another month" was granted Dr. Volck to present the subject of *arsenic*. The association was very instructively entertained by Dr. Volck with his microscope, and excellent sections of all kinds of teeth. The "*molar of a bat*," in which the doctor pointed to microscopical evidences of "decay," or some diseased action in the dentinal tissues, was regarded with particular interest, and some amusement.

Dr. J. B. Bean exhibited a specimen of *cast* aluminum plate, which was examined with interest,—its adaptability as a base for artificial teeth being confidently claimed by the author of the specimen.

The association congratulated Dr. Bean upon his success in *casting* so perfectly *aluminum* plates, and wished a record made of the fact, that this is the *first* successful effort known to the association in casting *aluminum* as a base for teeth.

Dr. Geo. S. Fouke exhibited a metal model, and remarked upon its utility in making male plaster models.

Dr. Fouke's skeleton model consists of a cast plate of iron, brass, or zinc, or a wrought-iron plate, perforated with a series of holes. In making a male cast, the perforated plate is pressed down into the wet plaster till it touches the highest point in the palatine arch of the impression. A male cast made in this way, with an *iron anatomy* in its body, bids defiance to the expansive quality of the plaster, while any possible injury to the "piece" in removing from the vulcanizing flasks is guarded against.

The association meets on the last Thursday of every month.

THE AMERICAN DENTAL CONVENTION.

The thirteenth annual meeting of this body will be held in the City of New York on Tuesday, the 5th of March next. The Executive Committee have made arrangements which will insure an interesting and entertaining session.

A cordial invitation is hereby extended to dentists throughout the country to be present, and take part in the proceedings of the Convention. Further particulars will appear in the New York daily papers.

W. C. Horne, *Secretary.*

OBITUARY.

John R. McCurdy.—We stop the press to announce the death, by consumption, at his residence in this city, yesterday (Sunday, January 27th, 1867), of John R. McCurdy, widely known to the profession—formerly one of the firm of Jones, White & McCurdy.

Samuel S. White.

A. M. Leslie, D.D.S.—At a meeting of the dentists of St. Louis, held in the Missouri Dental College Infirmary, on the 1st of December, 1866, Dr. H. J. McKellops was called to the Chair, and Dr. E. Hale, Jr., appointed Secretary.

The death of Dr. A. M. Leslie was announced by the Chair, and a committee of three appointed to prepare and submit suitable preamble and resolutions expressive of our feelings on this sad and mournful dispensation of Divine Providence.

The sudden and unexpected close of an active and eventful life, in a career of enterprise and usefulness, cannot fail to arrest the attention of the most thoughtless, and shroud an appreciative circle of acquaintances in the deepest gloom. Such was signally the case when the startling intelligence was flashed over the telegraphic wires, that our beloved Leslie

had died of cholera in the City of Memphis, on the morning of the 30th Nov., in the fiftieth year of his age. Away from all the ties and warm endearments of home, and wife, and children, who loved and honored him in no ordinary degree, his death is truly saddening to our hearts.

A. M. Leslie was a native of Edinburgh, Scotland. He was one of the first students in the Ohio College of Dental Surgery, in which he graduated in 1847, and soon rose to an honorable position in the faculty. He practiced his profession in Cincinnati until failing health compelled him to abandon its onerous duties and heavy responsibilities, when, in 1856, he came to our city and established the Mississippi Valley Dental Depot; and, although he then became a manufacturer and dealer, he lost none of his love for the profession or sympathy with its practitioners. Nor was he any less desirous to see it made more useful, honorable, and dignified, by properly educating and elevating its members. To this noble enterprise he devoted much of his time, talent, and means. His active and vigorous mind, suavity of manners, iron will, and indomitable energy enabled him to accomplish a great deal of good.

In the formation and conducting of dental societies (of which he had large experience) Dr. Leslie was unsurpassed.

In the organization and starting of the Missouri Dental College he was a tower of strength, and stood unrivaled. One of the last acts of his life was to influence a student to come from a distant State and enter its halls. Therefore

Resolved, That in the death of A. M. Leslie, D.D.S., the dental profession has sustained a great loss, and the Missouri Dental College one of its main pillars.

Resolved, That, in token of our sorrow for his death, affection for his memory, and high appreciation of his many virtues, and the bright Christian example of our departed friend and brother, we will place these proceedings on record in the books of the Missouri Dental College, and publish them in the dental journals of the country.

Resolved, That we hereby tender our true and heartfelt sympathy to the bereaved and sorrowing family and relatives of our deceased brother.

Resolved, That these proceedings be published in the *Missouri Democrat,* and copies, in gilt letters, on mourning paper, be furnished to the family.

All of which is respectfully submitted.

H. E. PEEBLES, D.D.S.,
AARON BLAKE, D.D.S.,
DR. ALEX. DIENST,
Committee.

JOHN S. CLARK, D.D.S.—At a meeting of the dentists of St. Louis, December 13, 1866, called for the purpose of taking suitable action in regard to the death of Dr. JOHN S. CLARK, a committee of four having been appointed, presented the following preamble and resolutions, which were unanimously adopted:

Whereas, it has pleased the Supreme Arbiter of the Universe to re-

move from among us Dr. J. S. Clark, one of the pioneers of dental progress in the West, we feel that we have truly lost one of our most talented, energetic, and useful members; and are desirous that his labors and sacrifices in behalf of the science should be duly acknowledged, and that his claim to the honor of having been chiefly instrumental in bringing into notice and perfecting valuable improvements in dental practice should be fully vindicated and handed down to posterity as a part and parcel of the history of the profession.

Dr. Clark was born in Brooklyn, Conn., in 1813, and received his literary education in that State. He moved to St. Louis in 1840, attended lectures at the Medical Department of the State University of Missouri, and, turning his attention to dentistry, soon ranked among the first operators of that time. By invitation of the faculty of the St. Louis Medical College, he delivered some lectures at the college to the medical students of that institution upon dentistry. He practiced his profession in St. Louis till 1850, when he removed to New Orleans, where he soon took rank as the first operator in the city. In 1858 he commenced publishing the "Dental Obturator," one of the very best dental publications that has been produced. He took his degree as Doctor of Dental Surgery at the Ohio College of Dental Surgery in 1851, was a member of the American Dental Association, and originated several valuable improvements in dental practice. He returned to St. Louis in 1865, in poor health, but with undiminished energy, and commenced practice again in this city; but his labors were short, as he was called to his eternal home on the 29th of November, 1866, after a short illness of a week. His energy, perseverance, and devotion to the cause of dental progress had endeared him to the profession, who feel that the place made vacant by his demise can never be refilled. Therefore

Resolved, That we regard the death of our co-laborer, John S. Clark, as a great calamity to the profession in which he had so long occupied a prominent and honorable a position.

Resolved, That to Dr. John S. Clark the profession is, to a great extent, indebted for the successful and philosophical mode of practice now generally adopted for the extirpation of the pulps from the fangs of teeth by the use of broaches, and filling the canals with gold, and also for the special elucidation of the process of plugging cavities with gold, performed by being rolled into cylinders and cones.

Resolved, That we tender the family of the deceased our heartfelt sympathies; and, though we mourn with them the loss of our professional brother and friend, we recognize in this afflicting dispensation only the accomplishment of the design of the Divine Creator, and bow with uncomplaining submission to the will of Him who doeth all things well.

Resolved, That these proceedings be published in the *Missouri Democrat*, and copies, in gilt letters, on mourning paper, furnished the family.

A. D. Sloan,
H. J. McKellops,
H. Judd,
W. N. Morrison, } *Committee.*

BIBLIOGRAPHICAL.

Magazines Received.—After a lapse of two years, during which it has been a frequent subject of wonder as to what had become of the two English dental magazines which used to come to hand so regularly, copies of each have been received, as follows: The Dental Review (a quarterly journal), edited by Robt. T. Hulme, M.R C.S., for July, and the British Journal of Dental Science, for August, September, and October. They contain a large amount of valuable reading matter, a portion of which is taken from the Dental Cosmos, with due acknowledgment. While thus disposed to take advantage of the contributions of our countrymen, the editor of the Review does not hesitate to strike at some of the absurdities with which we are afflicted. In the course of a complimentary notice of Prof. Wildman's monograph on Vulcanite, the editor says: "Many of the papers contributed to the dental societies and journals of that country (America) are written in such a high-flown and transcendental style as to render them unintelligible to ordinary intellects." The justice and correctness of this criticism must be apparent to all who prefer a clear, concise, and precise description of things, or presentation of ideas, rather than an affected or stilted enunciation of principles with which persons of the most ordinary attainments are supposed to be perfectly familiar. It is sincerely to be hoped that this practice will be abated, for the credit of such writers, the good of the profession, and the advancement of dental science.

In the British Journal, the propriety of forming local dental societies in all the large cities of Great Britain, in connection with the Odontological Society, has been suggested by Dr. Wm. H. Waite, of Liverpool, and is exciting considerable attention, and appears to be regarded with favor by the editors and contributors to the magazines. This is a step in the right direction; and, if properly carried out, will prove as valuable in advancing the interests of the profession in Great Britain as it has in America.

J. H. M'Q.

SELECTIONS.

Dental Register—December.

Nitrous Oxyd as an Anæsthetic.—"The use of protoxyd of nitrogen, after a protracted dormant period, has recently appeared as an epidemic. That it was so suddenly abandoned, and ether and chloroform substituted for it, is not remarkable, when all the circumstances are duly considered. The non-portability of the gas in sufficient quantities, the lack of apparatus fit to use for a purpose so serious, and the inconvenience in handling such apparatus as was afforded, were well calculated to turn the attention of the profession in other directions. The transitory effect of the pro-

toxyd was also urged as an objection to it, and justly, too, as far as prolonged operations are concerned.

"But the nausea, lassitude, and prostration accompanying or following the administration of other anæsthetics, and the fact that, now and again, the wail for the dead was commingled with the fumes of chloroform, have, to some extent, induced anæsthetists to return to their first love, and the protoxyd is rapidly regaining the place which it should have never lost. And, in consistence with the history of the discovery of anæsthesia, in this reform, if reform it be, the Dental profession is taking the lead. Not that Dental surgeons are more progressive or aggressive than general surgeons; but rather that most of their operations, though severe, are brief, and that their patients come to them, while, usually, the general practitioner must go to his, and many of his operations are protracted and tedious, rendering ether or chloroform more satisfactory. In the use of these, the recumbent posture is very desirable; but this is impracticable with most of the operations of Dental surgery, hence it is but natural that Dentists, above all others, should regard the protoxyd with favor.

"But it is possible, that even a good thing may be carried too far. It is acknowledged, by all, that ether and chloroform must be pure. To obtain them thus, in the present state of pharmaceutical chemistry, is not very difficult. Reliable manufacturers of the articles are well known. But not so with the nitrous oxyd. While it is fully as important that it be pure, it is more likely to contain impurities than other anæsthetics; and instead of being obtainable from reliable pharmaceutists, the operator has to prepare it for himself. It is not, therefore, to be wondered at, that mistakes occur, and that mischief is done. Indeed, in the present state of affairs, makers and venders of apparatus pressing their wares on the profession, members of the profession buying apparatus because their neighbors have them, and the people demanding freedom from pain in operations, without a willingness to go out of their ordinary haunts to obtain it, the wonder is that more serious consequences do not ensue. True, in the present lack of knowledge, in regard to the proper and legitimate action of the protoxyd, the evils resulting from the inhalation of an impure gas, are nearly always attributed to other causes. They are regarded as merely incidental, even though as legitimate as a burn on the finger, from thrusting it into the fire. A *propter hoc* is regarded as a mere *post hoc*.

"Protoxyd of nitrogen, or nitrous oxyd, is usually obtained by the decomposition of nitrate of ammonia. Several considerations in its preparation are worthy of close attention. The nitrate should be absolutely pure. It can now always be thus obtained from reliable chemists. Its composition, as its name indicates, is one equivalent of nitric acid united with one of ammonia. Nitric acid is composed of one equivalent of nitrogen combined with five of oxygen, and its symbol is NO_5. Ammonia is formed by the union of one equivalent of nitrogen and three of hydrogen, its formula being NH_3. The formula of nitrate of ammonia is, therefore, $NH_3.NO_5$. I am thus minute because I have no right to infer that the readers of the 'REGISTER' are all technical chemists. The water of crystallization is not included in the formula, as it has nothing to do with the phenomena of the decomposition.

"Now, it will be observed that the three elements composing the nitrate are, when free, all gases. By their native elasticity they have a tendency

to resume the gaseous form. This elastic is increased by heat; and that is the reason that heat alone is able to decompose the nitrate. As the decomposition takes place, new affinities assert themselves. That between oxygen and hydrogen is, perhaps, the strongest known to chemistry. Accordingly, the three equivalents of hydrogen take three of oxygen, and form three equivalents of water. The remaining two equivalents of oxygen take, each, one of the nitrogen, and form the nitrous oxyd, or protoxyd of nitrogen, under consideration. The reactions which take place, when this order of decomposition is perfectly carried out, are clearly set forth by an equation:

"$NH_3.NO_5 = 3HO + 2NO$.

"When the nitrate is pure, and properly decomposed, the only results are three equivalents of water and two of nitrous oxyd. But the nitrate is sometimes contaminated with *sal ammoniac*, in which case, chlorine, a poisonous, suffocating gas, will be commingled with the nitrous oxyd.

"But even if the nitrate of ammonia be pure, it may be decomposed by heat, so as to give an impure nitrous oxyd, or even none at all. Nitrogen and oxygen combine in so many proportions, and thus give rise to compounds differing so greatly in their chemical and therapeutic properties, that, to be safe, every step of the process of decomposition must not only be understood, but accurately performed. For example, if the nitrate be decomposed at too high a temperature, instead of nitrous oxyd and water, as in the preceding equation, we may have binoxyd of nitrogen, called *nitric oxyd*, water, and free hydrogen, represented thus:

"$(NH_3, NO_5) = 2NO_2 + HO + H_2$.

"Or, at a still higher degree, we may have nitrous acid, ammonia, and oxygen, thus:

"$NH_3.NO_5 = NO_4 + O + NH_3$.

"Or, a little higher, the changes are thus represented:

"$2\ (NH_3.NO_5) = NO_4 + 6HO + N_3$.

"Any one who can read a chemical formula, will see at a glance, that in any of these decompositions, there is nothing that can sustain respiration for a single inhalation, while an active corrosive poison is present in each of them.

"But it is claimed by some, perhaps by many, that these, and all other impurities are removed by washing, that is, by passing the gas through water, on its way from the generator to the receiver. At first sight, this is plausible, and may, therefore, deceive many. But let us examine, as the health, and perhaps the lives of our patients are at issue.

"Nitrous acid, NO_4, and ammonia, NH_3, are both highly soluble in water, and may, therefore, be readily removed by washing. But with the nitric oxyd, or binoxyd of nitrogen, NO_2, the case is far different. And, as it is the poison most likely to be formed, it is very important that it be understood.

"Nitric oxyd is a colorless, tastless gas, about as heavy as atmospheric air; it excites violent spasm of the glottis, when an attempt is made to inhale it. Water dissolves only *about* 11 *per cent. of it.* In contact with atmospheric air, it is converted into *nitrous acid*, which, in contact with water (liquid or vapor), is changed to *nitric acid.* (See Turner's, Graham's, or any standard work on chemistry.)

"From the above, it will be seen that nitric oxyd cannot be washed out of nitrous oxyd, as water dissolves only 11 per cent. of it, while it dissolves about its own bulk of nitrous oxyd. If generated by itself, or

along with nitrous oxyd, it will pas through the washers into the reservoir, or gasometer. Then, if it be inhaled, its effects may be varied. When pure, it cannot be inspired, on account of the violent spasm of the glottis produced by it; but diluted with other gases, it may be. Let it be remembered that it is highly corrosive, and its effect on the mucous membrane of the air-passages may be appreciated.

"But this is not all, nor the half: nitric oxyd in contact with air, turns to nitrous acid, and this, in contact with water, to nitric acid. As both air and water are always present in the bronchial tubes and cells of the lungs, it is not possible that nitric acid be not formed, if nitric oxyd be inhaled; for the laws of chemical combination are laws of the unchangeable God.

"Nor is this all. But if one would boil nitric acid, and cause a patient to inhale the vapor, it would be regarded as quite enough to damn him to infamy, and drive him from the profession. But in that case, the acid would be in its ordinary, or quiescent state, while in the other, its nascent condition gives it greatly increased energy of action.

"From the above, it follows that nitric oxyd is *the impurity* to be dreaded in the use of nitrous oxyd as an anæsthetic. The question arises, how is its presence to be avoided. Various attempts have been made to answer this. Protosulphate of iron is sometimes put into the wash-bottles. This salt absorbs nitric oxyd. But unless we know how much we are going to make, while not intending to make any, we cannot tell how much of the sulphate to use. Another method is, to admit atmospheric air into the gasometer, the oxygen of which changes the nitric oxyd to nitrous acid, which will be removed by the water; but there is no way to determine how much air to admit. If too much, it dilutes the nitrous oxyd. If too little, it fails to remove the nitric oxyd. In short, the only way is, not to generate any nitric oxyd. And, to attain to this result, we must have apparatus by which the heat can be kept nearly uniform through the entire process of decomposition. Take, for example, a gasometer which requires an hour and a half to fill it. The process may go on exactly right for an hour and a quarter, but, by too high a temperature during the last fifteen minutes, enough of nitric oxyd may be formed to poison the entire contents of the gasometer. No man can give such attention to the process, with ordinary apparatus, as will enable him to *know* that he has not a mixture of nitrous and nitric oxyds in his gasometer, instead of *pure nitrous oxyd.*

"With the uncertainty of the ordinary processes of decomposing nitrate of ammonia, it is not strange that soreness and congestion of the air-passages are so frequently observed after the use of the nitrous oxyd. Defective apparatus in the hands of the inexperienced, and those without chemical education, is likely to result imperfectly. A man may be a good anatomist, and a fine operator, without a thorough knowledge of this process; for it is *strictly chemical.* Many are honestly experimenting without sufficient chemical knwledge to be aware of the danger—some, possibly, so far back as to be unwilling to learn. Though a teacher of chemistry for nearly a quarter of a century, I never would, *never did*, and NEVER WILL use a nitrous oxyd apparatus, even for amusement, without the ability absolutely to control the temperature at which the gas is generated. The man of science has no more right to profane the laws of nature than the minister of the gospel has to profane the laws of revelation. Sprague's apparatus gives us thorough control of the process of

decomposition, and there may be others that do, but I have not seen them. If not in existence now, I take it for granted that such soon will be.

"But I began only to write a page; yet the subject is by no means exhausted. I may refer to it in a future number." W.

DEATH IN A DENTIST'S OFFICE—CORONER'S INQUEST.

We condense from the daily papers the following account of this unfortunate affair:

On Monday afternoon last, Mr. Edmund Korosine, aged 23 years, and residing at No. 1135 South Eighth Street, went to the office of D. R. Lee, dentist, 226 West Washington Square, for the purpose of having a tooth extracted. Mr. Korosine requested Dr. Lee to administer nitrous oxide gas. The gas was given and the operation performed, but immediately afterward the patient was taken with spasms, and died in the office in about one hour and a half. The coroner was notified, and Dr. Shapleigh made a post-mortem examination. A jury was summoned, and among the evidence elicited was the following:

Mr. Rolph Lee, sworn.—The deceased came to me on Monday, and said he wanted me to use the gas; I administered the gas to him, and as he did not breathe as I thought properly, I threw the bag away; the tooth was a very simple one to extract; when the tooth was being extracted he moved his head, the tooth slipped out of the instrument and went down his throat; I made all endeavors to get it out, but without avail; I put a cork in his mouth; I have the tooth which he spit out, and the cork in my possession.

A number of witnesses were produced who testified to the ability of Dr. Lee as a dentist, and his success in administering the gas.

Dr. Shapleigh, Coroner's surgeon, sworn.—I made a post-mortem examination of the deceased on Wednesday; he was rather thin, a medium-sized man; I examined his lungs, they were in a healthy condition; the right lung was slightly congested; the left hardly at all; I removed the windpipe and discovered within it this cork (cork shown), which is about one inch long; the cork had entered the small end first; the deceased, in my opinion, came to his death from this cause; also, the symptoms described by Dr. Klapp and others were caused by this cork being in the windpipe.

Dr. Joseph Coad substantiated Dr. Shapleigh's testimony.

The jury returned the following verdict: That the said Edmund Korosine came to his death by suffocation, caused by a cork, which had been placed between his teeth by the dentist, Dr. Rolph Lee, No. 226 West Washington Square, to prevent contraction of the jaws during the operation of extracting a tooth, lodging in the windpipe, Jan. 24, 1867.

PERISCOPE OF MEDICAL AND GENERAL SCIENCE IN THEIR RELATIONS TO DENTISTRY.

BY GEO. J. ZIEGLER, M.D.

"*Sugar as an Article of Diet.*—DUTRONE calls sugar the 'most perfect alimentary substance in nature.'

"Dr. Rush says it affords the greatest quantity of nourishment in a given quantity of matter to any subject in nature.

"Sir John Pringle tells us that the plague has never been known to visit any country where sugar composes a material part of the diet of the inhabitants.

"Dr. Cullen is of the opinion that the frequency of malignant fevers of all kinds has been lessened by the use of sugar.

"The celebrated Tronchina recommends *eau sucre* (sweetened water) for almost every malady.

"Dr. Fothergill was very anxious that the price of sugar should be so far reduced as to make it accessible to the common people.

"Dr. Franklin had taken large quantities of blackberry jam for relief from pain of the stone, but discovered at length that the sanitary property resided wholly in the sugar.

"Sugar has been found to be an antidote for the poison of verdigris, if taken speedily and in abundance.

"It has been said that sugar injures the teeth, but this opinion does not deserve a serious reflection.—*Vide Am. Phil. Trans.*, vol. iii.

"The Cochin Chinese consume a great quantity of sugar; they eat it with rice, which is the ordinary breakfast of the people of all ages and stations, and there is but little else to be obtained in all the inns of the country but rice and sugar. The Cochin Chinese not only preserve in sugar all their fruits but even the greater part of their leguminous vegetables, gourds, cucumbers, radishes, artichokes, the grain of the lotus, and the fleshy leaves of the aloe. They fancy nothing is so nourishing as sugar. The body-guard of the king, selected for the purpose of pomp and show, are allowed a sum of money with which they must buy sugar and sugar canes, and they are compelled by law to eat a certain quantity daily. This is to promote their embonpoint and good looks, and they are honored by a near approach to the person of the king, and they certainly present a handsome appearance, being actually fattened sleek and plump by sugar.

"The plentiful use of sugar is one of the best preventives of the diseases produced by worms. Nature seems to have implanted a love for this aliment in children, as if it were on purpose to defend them from these diseases.

"Sorghum syrup is consumed by many families in the West in prodigious quantities. It is a home product, comparatively inexpensive, takes the place of butter and fat, children are fond of it, and no restriction is imposed upon its use. Probably a larger quantity of sugar, in the shape of sorghum syrup, is consumed in families where it is made on the farm and used freely by all the members, than was ever before used by as large a number of persons in any part, or in any age of the world. And yet we have never heard in any single instance, a suspicion expressed that

its use was attended with any injurious effects. On the other hand, it is quite common to hear that its free and abundant use in families has been attended with improved average health, particularly among children.—*Sorgho Journal.*

"I may add that some six years ago, about one hundred Chinamen were employed at one of our iron foundries, on the Cumberland River, below Nashville; they lived and labored most efficiently on the sole diet of *molasses* and boiled rice."—Dr. Paul F. Eve.—(*Nashville Jour. of Med. and Surgery.*)

Experimental Physiology in Relation to Conservative Surgery.—In the course of an able introductory lecture at the Meath Hospital, Dr. Wm. Stokes made (*Dublin Med. Press*) the following instructive remarks on this subject:

"The method of investigation which I allude to, and which has already done and promises to effect so much toward the improvement of surgical therapeutics, is experimental physiology. Against this the once loud but absurdly sentimental outcry is now, fortunately, become so feeble as hardly to be heard. In France the importance of explaining human pathology by experimental physiology has been fully recognized by the enlightened government of that country, and, accordingly, a chair of Comparative Pathology has been established in the Paris Faculty of Medicine. It would be impossible for us on the present occasion to attempt discussing all that has been gained for us in this direction by physiologists. I may mention, however, what appears to me to be one of the most important results of this method of investigation for operative surgery; one which has in many places entirely altered the mode of procedure in what may be ranked among the most formidable of surgical operations—namely, the resection of the larger joints. This change has taken place in consequence of the attention of surgeons having been directed, by Professor Syme first, and afterward by M. Ollier, to the remarkable osteogenetic properties of periosteum, which were at all events but imperfectly understood previous to the important researches of these and other eminent surgeons. Now, not only in resections is the importance of carefully preserving this membrane recognized, but other operations have been signally modified. The transplantation of the membrane, for example, in the so-called Indian Rhino-plastic has many advocates, and in the Urano-plastic operation for the repair of defects in the hard palate, resulting either from disease or congenital malformation, this is now a fully recognized step of the procedure.

"The priority of this modification in this operation is claimed by the Berlin school, but I do not think altogether with justice, for it cannot be denied that for many years anterior to its publication in Berlin it was in America performed in this manner by Mr. Warren, and in this hospital the practice of my colleague, Mr. Collis. In the recent wars in America, in Schleswig-Holstein, and Bohemia, the importance of careful periostial preservation has been fully recognized by military surgeons. Among others, Dr. Moon, of Philadelphia, relates a case of absorbing interest of a man whom he treated for a gunshot wound in the right leg, which he received at the battle of Petersburg in July, 1864. Some of the particulars of the case are related as follows: 'A Minié ball entered the upper third of the outside of the right leg, passing down obliquely through the spine of the tibia at its middle third, carrying away a small portion

of the bone, and emerging at the inner side of the leg. The injury to the bone, though apparently slight, proved to be one of those contusions which destroy the vitality of the tissues to a considerable extent, and eventuate in a large amount of ecchymosis. Sloughing of the soft parts first in the track of the wound, and then of the bones, supervened. The slough of the bone also extended until two-thirds of the tibia became involved in its entire circumference. Abscesses formed constantly, which were required to be opened. Active inflammation subsiding, it was decided to remove the sequestrum, which proved to be eight inches and a half in length, from the epiphysis of the ankle-joint. The periosteum being in a measure loose, and quite easily detached, the posterior portion of it was left in the entire extent of the shaft. An incision along the spine of the tibia, exposing nine or ten inches of the bone, was made, when the sequestrum was readily removed by means of bone forceps. The case progressed rapidly and favorably, new bone forming the whole length of the periosteum left in the wound.' . . . . . On May 10, 1865, he wrote—'I am at work at my trade, coach-building, and have complete use of my injured leg, running up and down stairs as well as any of the workmen. The wound has entirely healed, and new bone formed throughout.' In another case five inches and a half of the tibia were removed, the periosteum being left, and resulted in a like cure. A still more remarkable case occurred during the recent Schleswig-Holstein campaign in 1864, in which the Prussian Surgeon-General, Professor Langenbeck, performed a sub-periostial resection of a large portion of the diaphysis of both tibia and fibula, and which was brought to a successful termination with complete re-formation of bone. In this war, also, five cases of sub-periostial resections of the ankle-joint were performed by him, four of which recovered. In general, however, the resections were not so successful as they were during the first Schleswig-Holstein war in 1848, and this, Professor Langenbeck informed me, he attributed to the recent improvements in gunnery, which, at all events, as surgeons we must deplore. Owing to this, the injuries met with on the field of battle now, and requiring resection, are generally much more formidable than they used to be. For the bone, when struck, is to a great extent actually pulverized, and the minute particles of bone, being driven in all directions through the surrounding muscular and other soft tissues, produce in this way a condition of parts most unfavorable for resection. This may possibly account for the ill success of the American military surgeons in their performance of the operation at the knee joint. Not one of the numerous cases reported in Circular No. 6 (a most admirable account published last spring by the American government of the surgical experiences acquired during the war) terminated successfully. This must, doubtless, carry some weight in estimating the merits of this procedure, which has so long been a subject of surgical dispute in the Dublin school. However, we should be very slow in forming any decided opinion on its merits in civil practice from experience of this sort alone. For, in addition to what I have mentioned, the exciting collateral circumstances which necessarily exist must militate strongly against successful results being obtained in surgical operations of such magnitude.

"M. Ollier, of Lyons, as I mentioned previously, has directed especial attention to the importance of periostial preservation and transplantation in many operations. In three cases he has removed large portions of the diaphyses of the long bones with favorable results. In his other

cases an epiphysis of the bone had to be removed. One of these I had an opportunity of seeing, in which the upper half of the humerus was removed, with complete restoration of bone. From his experiments, therefore, and clinical experiences, as well as from those of some others who are deeply interested in this subject, and from the cases of Dr. Moon and Professor Langenbeck, the following propositions may be stated:

"I. That in sub-periostial resections the reproduction of bone is more complete and effected with greater rapidity than after total removal of both bone and periosteum.

"II. That the osseous reproductive properties of the membrane vary according as it is taken from the long or the short bones, being greater in the former than in the latter (Ollier).

"III. That the normal form of the joint is better preserved when this precaution of leaving the periostial covering is taken.

"IV. That the sub-periostial resections involve less danger than when conducted on the old principle. This proposition is grounded on the result of experiments on the lower animals, the number of unfavorable results which followed when the membrane was removed, being much greater than when it was left.

"V. That the difficulties attending the separation of the membrane in the dead subject are not to deter us from attempting the operation on the living, inasmuch as the membrane is less adherent in the latter, and also in the diseased than on the healthy bone.

"VI. That resections performed in this manner are more conservative, inasmuch as a re-formation of the part removed is effected, and, being attended with less risk to life than the ordinary resections, a greater quantity of bone can be removed, and in this way in a number of cases the necessity for amputation is diminished. The cases I have alluded to—of Dr. Moon in America, and Professor Langenbeck—are illustrative of the truth of this.

"VII. That the chances of much shortening of the limb are diminished by this method, as shown by the results of the ankle-joint resections during the late Schleswig-Holstein war.

"VIII. That in addition to these the modified Rhino- and Urano-plastic operations demonstrate that the happiest results have been obtained by this application of experimental physiology to practical operative surgery."

"*Plastic Surgery.*—At a late reunion of the New York Medical Journal Association, Dr. Gurdon Buck, Surgeon to the New York and St. Luke's Hospitals, etc., made some remarks on this subject, and submitted two patients who had been operated on.

"The doctor remarked that plastic surgery had been applied to the face more frequently than to any other region of the body:

"1. To remedy congenital defects, especially the varieties of hare-lip.

"2. To repair the loss of parts produced by disease, such as cancrum oris, syphilis, scrofula, lupus, etc., or by injuries inflicted by missiles, fire-arms, or other forms of violence.

"The various operations of plastic surgery, for the most part, conform to two fundamental methods, the application of which to any particular case, must be determined by the judgment and ingenuity of the surgeon. They are,

"1. By gliding neighboring integument, that has been previously detached, so as to supply lost portions.

"2. By transposition; that is, raising a patch of integument more remote, leaving it attached at one extremity, and transferring it within the limits of half a circle, to the seat of the deficiency to be supplied. As is done, for instance, where a flap is raised from the temple to repair the eyelids, in which case the flap is made to sweep a quarter of a circle; or where a patch is raised from the middle of the forehead to repair the nose; in this case the patch is made to sweep half a circle."

"*Hare-Lip.*—This plaster mask represents an example of double harelip, complicated with a double fissure of the hard palate, and a very salient intermaxillary bone. The intermaxillary bone, which expands out sufficiently to support three incisor teeth, is continuous with and terminates anteriorly the septum nasi. A central cordiform portion of the upper lip is continuous with the columna nasi, and rests upon the projecting intermaxillary bone. The alæ nasi, with the halves of the upper lip, gap widely, the whole presenting a very revolting disfigurement. The patient was a girl, eight years old. The method of operating was as follows:

"1st. Dissecting the central tongue of the upper lip from the intermaxillary bone, leaving it connected with the columna nasi.

"2d. Excising the intermaxillary projection on a line horizontally with the inferior free edge of the vomer.

"3d. Paring the edges of the central tongue, and applying and securing it by stitches to the fresh-cut edges of the vomer, and thus completing the columna.

"4th. The halves of the upper lip being put on the stretch, the mucous membrane was divided along the line, where it assists the upper jaw to cover the inside of the cheek; this division was carried as far out as the last molar tooth; it was also carried upward, on each side of the nose, toward the orbit. Upon the thorough performance of this step of the operation, depends the facility of approximating the two halves of the lip, and securing them in coaptation without strain upon the sutures.

"5th. Paring and coapting accurately the vertical edges of two halves of the lip, and securing them with sutures. No adhesive straps were applied. The progress and final result were satisfactory."

"*Two Cases of Plastic Operation to relieve Deformity of the Face.*—1st. This boy has been a patient at St. Luke's Hospital, where the operations to be described were performed.

"He is six years old, of German parentage, and resident of Williamsburg, Long Island.

"About one year ago, while ill of a low form of fever, the destruction of the face took place, from what is supposed to have been cancrum oris. This plaster mask represents his condition before the first operation. The right half of the upper and lower lip, and the neighboring portion of the cheek, are gone, and also the columna nasi. The jaws are held in close contact by the cicatrix of the right cheek bordering the lost parts. The remaining left half of the upper lip terminates at the median line, below the septum nasi; the terminus of the left half of the lower lip extends a little further to the right side, beyond the upper lip.

"*Operation.*—An incision was carried transversely through the upper lip, at its junction with the nose, and continued outward through the left

cheek, nearly to the masseter muscle; the same was done to the lower lip, on a line corresponding to the line where the mucous membrane quits the lower jaw; this incision was parallel to the first, and carried to the same extent through the left cheek. The entire flap thus formed terminating by the two half lips, was stretched across to the right side, and secured to the edge of the cheek previously prepared, by detaching it extensively from the upper and lower jaw. In doing this it was ascertained that the lining mucous membrane of the cheek had been destroyed by the original disease, and the cavity of the cheek consequently was obliterated. Sutures were inserted in close proximity, to secure the most accurate adjustment of the part. The subsequent progress of the case was favorable, and the result obtained is shown by this second mask. You see the mouth is reconstructed, of natural form, but scanty in length, and situated very much to the right, so that its left angle is on a line below the left ala nasi.

"A second operation was performed in September last, for the purpose of enlarging the mouth, by extending the left angle. It was done as follows: An incision along the line of the vermilion border was made to circumscribe the left angle of the mouth, being carried only through the integument; a double-edged, sharp-pointed knife was then insinuated, flatwise, between the cheek and lining membrane in a direction outward, as far as it was intended to extend the mouth; the detachment of the lining membrane was also carried upward and downward at the same time. The cheek was now divided on a line with the commissure of the mouth, a distance of three-fourths of an inch. The lining membrane was divided to the same extent, and the edges of both accurately brought together, and secured with fine sutures closely inserted. Everything did well, and resulted, as you see, in the boy's present condition. His appearance is greatly improved, and something has been gained in the increased mobility of the lower jaw; still further improvement may be realized by the persevering use of a wedge of wood, which he carries suspended to his jacket button-hole, and which he keeps between the teeth as much of the time as possible.

"2d. The next case is an older boy, twelve years of age, of German parents, and resident in Jamaica, Long Island.

"One year ago, according to his mother's statement, while she and her husband were both sick with intermittent fever, the boy took sick, and was cared for by the neighbors. After being in a state of delirium and unconsciousness for three weeks, the right cheek became red and swollen, and, on examination by the doctor, a black spot was found on the inside of the cheek, that spread and resulted in the destruction of the neighboring parts, to the extent represented by this plaster mask, taken soon after his admission to St. Luke's Hospital. The right half of the upper lip, and neighboring portion of the cheek, and the right ala nasi, are gone. The teeth and gum, as far as the first molar, are exposed to view. The right half of the lower lip is stretched and lengthened, and terminates above and near the first right upper molar, where it adheres to the maxilla. Articulation is somewhat defective; other functions remain unimpaired.

"*First Operation.*—The lower lip was divided at its right terminus, by an incision at right angles to its border, and to the depth of one inch. From this point another incision was carried transversely through the entire thickness of the lip to the middle of the chin, thus making a square-

shaped elongated flap, lined by mucous membrane, and intended to be bent edgewise upon itself, and matched on to the end of the left half of the upper lip, in the median line. To effect this, however, it was necessary to divide the flap through half its breadth at its base, by an incision carried obliquely from the middle of the chin upward, and toward the left angle of the mouth. This permitted the flap to be bent edgewise, and to be brought in coaptation with the left half of the upper lip, which had been previously detached from the upper jaw extensively, upward and outward, and its end pared. One twisted fine suture, and several interrupted sutures, secured these ends in coaptation. To approximate the neighboring cheek to the newly transposed parts, it was necessary to carry an incision transversely across the upper part of the right cheek, and dissect up the integument from the subsequent tissues, so as to glide it forward to meet the transposed underlip, and fill up the space; this was accomplished, and nothing further attempted, after securing the parts in coaptation by numerous interrupted sutures. Adhesion by first intention followed almost completely. This plaster mask shows the result. The right half of the mouth is rounded, instead of angular and pointing.

"*Second Operation.*—This had for its object to raise a patch from the middle of the forehead to cover the right side of the nose and the neighboring deficiency of the cheek. The same successful result followed this operation as the preceding, and, as is shown by this third mask, a redundancy of the transplanted flap forms a salient eminence over the bridge of the nose.

"*Third Operation.*—This was performed in September last, and was intended to improve the shape of the mouth, by converting the rounded turn of the right half into an angle, and extending it further on the same side; also the removal of the redundancy of integument over the ridge of the nose. The operation for the improvement of the mouth was the same as that already described in the case of the other boy, and with an equally good result. An elliptical portion of skin was removed from the edge of the nose, and the edges of the wound brought together by sutures. An inspection of the boy's face can now be made, and the final results of these several operations appreciated."—(*Med. and Surg. Rep.*)

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"*Hare-Lip.*—Reported by Dr. Napheys. Surgical Clinic of Prof. Gross, Jefferson Medical College.—Samuel W., æt. 6 years. This child is suffering from hare-lip, affecting the left side, for which an operation has been performed, the defect in which was, that there was not a sufficient amount of lip removed, and in consequence, an unsightly notch left at the prolabium.

"Hare-lip consists in a congenital cleft or fissure of the upper lip, the lower never being affected in this way. The latter is the frequent seat of cancer, while the upper lip rarely suffers from that disease.

"Hare-lip may be simple, or complicated with fissure of the palate and bifed uvula; it may be single or double, as when it occupies both sides of the middle line, leaving a projection between, standing out very much like the snout of one of the inferior animals. It is not only unseemly, but interferes with sucking in early infancy, with deglutition and articulation, for which reasons it becomes the subject of surgical operations. How hare-lip is produced has not been determined. It has been supposed to be the result of arrest of development, but why it should take

place here or at all is not known. It is frequently associated with club-foot, sometimes with hydrorachitis, and occasionally with extrophy of the bladder.

"The operation consists in paring the edges of the fissure freely with the knife, the lip having been, as a preliminary step, detached from the gums on each side. The parts are then brought in contact by means of the twisted suture, the first pin being placed in the prolabium just at the upper margin, taking a firm hold, the second higher up; sometimes a third is used, but very seldom in a child. The pins should be an inch and one-third, or one-half, in length. The thread is twisted around each pin in the form of an ellipse, the extremities being crossed so as to make equable pressure on the intervening portion of the lip, thus obviating the necessity for the application of adhesive strips.

"The child was wrapped up in a sheet, and the parts pared and brought together in the manner indicated."—(*Ibid.*)

Malformation of the Mouth, Nose, and Palate of an Infant at Birth.—DR. JACOB RITTER, of Liverpool, Perry Co., Pa., relates in the *Med. and Surg. Reporter*, the following interesting case:

"The superior maxillary and lip are all wanting between the nares (a space of one inch). On the verge of the right maxillary there was a tooth sufficiently developed for a child of three years of age; it was loose, and a source of annoyance, so I removed it with the fingers. The nose is flat; it lacks the vomer and septum nasium. The palate is very small and imperfect; it is detached from the maxillary bone entire; it is in the centre of the posterior roof of the mouth, but does not extend more than half way forward, so that the anterior part under the nose is all wanting. On the verge of the nose there is a tumor (not a polypus), consisting of two parts, attached together at the upper end. They are of a flattened shell-bark shape. They are attached to the margin of the nose by a narrow pedicle. One is about an inch in diameter; the other about half an inch. They are vascular, red, and, I think, of a fibroid tissue. They feel rather solid; are movable. They possess no distinct pulsation. The smaller part lies in the cavity of the mouth. The other protrudes out of the mouth. This tumor does not seem to grow in proportion with the child. Deglutition is difficult; it cannot suck the breast. To the inner or posterior part of this tumor there was a small bone attached, extending back to the front part of the palate, where it adhered. It was the thickness of a common quill, and lacked periosteum. I removed it without any difficulty. I have proposed tying the tumor with a waxed-silk ligature, to avoid hæmorrhage, and then cut it off. But the parents object, as yet, on account of its youth. If this obstruction was removed, in the course of time the palate and maxillary might be supplied; the lip also by a plastic operation. The child is aged three months, and is healthy. Its parents are moral, religious, and well developed.

"The above is as good a description of the case as I can give without a microscopical examination. Cause of deformity is imputed to the mother looking too frequently at a large show-picture that was pasted up in front of her house, on which was exhibited the hippopotamus, with its mouth wide open, showing its tusks. It has long since been conceded by ancient as well as modern observers that impressions can be made on the fœtus during gestation. This should serve as a caution to mothers. The infant has since died of dysentery."

Staphylorraphy.—In a letter from Berlin to the *Chicago Med. Examiner* Dr. Jno. M. Woodworth states "Professor Langenbeck's operation for remedying the defect of cleft palate, consists in raising the periosteum in connection with the soft parts, thereby securing a bony roof to the mouth. In describing this operation I will not attempt to enter into details, except as they bear particularly on Prof. Langenbeck's operation. After freshening the edges of the fissure, two incisions are made on either side of the roof. The connecting mucous membrane left intact, serves to hold the flaps in proper position when they are loosen ed up, and also obviates the necessity of inserting ligatures, which could not be avoided if one long incision should be made instead. The incisions are made from behind forward, thereby avoiding the blood, and leaving a clear field for cutting. For this part of the operation, a strong scalpel is used, having a convex cutting edge; then by means of elevators, the periosteum is separated from the superior maxilla. For loosening up the periosteum from the palate bones, where it is not convenient to work with the elevators, a double-edged scalpel with flexed ends, and one with a broad and flexed end, are considered the best forms. When the flaps are completely loosened up, the freshened edges approximate each other, and they are then united with silk ligatures, which are inserted by means of a needle. This needle is arranged with a small sliding steel wire; after the needle is inserted, this wire, which has a small hook on the end, is slipped out and the ligature secured, when the needle is withdrawn, bringing the ligature with it. Two wire hooks to insert in the mouth, connected by a rubber band to pass behind the neck, is a simple apparatus for keeping the mouth on the stretch laterally. I have witnessed six aranoplastic operations by Prof. Langenbeck, and in all very favorable results have been secured."

"*Artificial Velum and Palate.*—Dr. Wynn Williams introduced Mr. Ramsay to the fellows of the Royal Medical and Chirurgical Society, he being desirous of exhibiting to them a patient in whom he had fitted an artificial velum and palate. The patient was suffering from congenital cleft palate, both soft and hard. He had been operated on for hare-lip in infancy. The apparatus adapted to supply this deficiency consisted of a piece of hard vulcanite with two teeth attached to the anterior portion. This supplied most accurately the deficiency in the hard palate. The fissure in the soft palate is closed by means of a piece of soft vulcanite attached to the hard, which is capable of being pressed slightly upward and downward by the muscles of the fauces, thus effectually closing the passage to the nares during speech and deglutition. The patient has worn the instrument for about twelve months with the greatest comfort to himself, and was now able to articulate and converse very plainly. He was asked to repeat the alphabet, which he did most distinctly, stating also that he could now articulate much more plainly even without the palate than he was able to do previous to wearing it. He removed and reintroduced the instrument to show with what facility he could do so.

"Mr. Ramsay showed models of several other congenital cases of cleft palate which he had treated in the same way—one of a young lady, the fissure having previously been attempted to be closed by operation, but without success; also another of an enormous cleft measuring an inch and a half across, in which he had also successfully supplied an artificial palate and velum."—(*Lancet.*)

"*Exsection of the Superior Maxillary Bone; Plastic Dentistry.* By F. I CUMMINS, M.D., of New York.—A very interesting case in surgery and dentistry has recently come under the notice of both professions in this city. About the middle of last month a patient came to Dr. J. M. Carnochan, suffering from disease of the upper jaw, resultant on the unskillful extraction of defective teeth about eight years ago in Australia. Since that time, the patient, having been out of the reach of the best practitioners, had passed through all the stages of ulceration, sloughing, and caries, until at the period of his coming to Dr. Carnochan his masticatory power had been entirely, and his speech nearly destroyed. Dr. Carnochan proceeded to exsection of the upper maxillary, and found the parts so far gone that he was obliged to remove the entire structure from the articulation with the lower jaw (leaving the articulation perfect) upon the right side, to within a distance of three molars from that upon the left. The destruction of the soft parts had created an aperture through the floor of the antrum by which the forefinger could be passed into the fossæ, and the perpendicular plate of the ethmoid was plainly visible. The case was then handed over by Dr. Carnochan to Dr. Geo. H. Perine, of 22d Street, a dentist, well known as former editor of the *New York Dental Journal*, as a skillful manipulator, and the discoverer of several very ingenious methods and appliances in dentistry. Dr. Perine undertook the difficult task of restoring the jaw, beginning by making, in the first instance, a hypothetical mould as near the contour of the cavity as was possible by the eye alone, and through successive castings and adjustments finally succeeding in adapting a vulcanite rubber base, which, with the artificial teeth attached to it, perfectly replaced the missing parts.

"The aperture through the floor of the antrum greatly complicated the difficulties to be overcome, rendering the suction upon which the artificial maxilla depended for its retention *in situ* so defective, that it was absolutely necessary to close it before the adhesion of the vulcanite could be relied on. The preliminary castings as well as the permanent structure had to be carried up through the floor, and as the aperture necessarily increased upward, the resistance to the removal of the cast unbroken was an obstacle which it required much ingenuity to overcome. Dr. Perine effected the removal by causing the patient to hold his breath, at the same time blowing into his nostrils with the full force of his own lungs, while an assistant steadily pulled at the cast below.

"In seven weeks from the date of Dr. Carnochan's operation, the patient was wearing the artificial jaw and teeth (a permanent set, at least until further absorption renders some readjustment necessary) without pain or discomfort. The attachment was perfect, and the power of mastication was entirely restored, as well as vocal articulation and the contour of the features. The most intimate friends of the patient, not previously informed of the substitution, met him constantly without a suspicion of the change which had occurred since he went to Australia. In view of all the facts, this case, which up to the present date (Nov. 30) remains in *statu quo*, is one of the most remarkable combined triumphs of surgery and dentistry."—(*Boston Med. and Surg. Journ.*)

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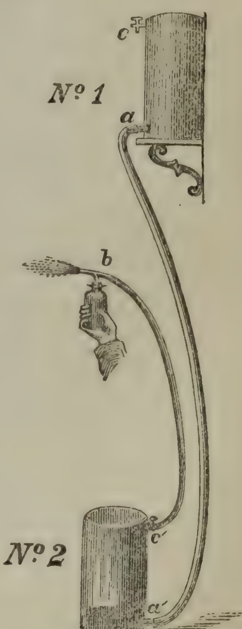
"*Immobility of the Jaws.*—According to LEOPOLD BERRUT, three different causes may be assigned therefor: 1st. Anchylosis by muscular contraction, which, when without complication, needs to be treated simply by

muscular section and by dilatation. 2d. Bony anchylosis, which requires section or resection of bones. 3d. Anchylosis by production of cicatricial tissue, anteriorly or posteriorly to the joint."—(*University Journal of Med. and Sur.*)

"*Hydrostatic Atomizer or 'Exsufflator.'* Read before the Norfolk (Mass.) District Medical Society, November 14th, 1866, by G. J. ARNOLD, M.D., of Roxbury. — Since fluids were first atomized for local anæsthesia, various more or less perfect methods have been adopted for the purpose. The more common apparatus consists of India-rubber bulbs, so arranged that while one acts as a bellows the other is designed by its elasticity to keep up a constant and equable pressure. Although excellent in theory, practically it frequently disappoints; for besides other defects, it requires an assistant, and it is almost impossible for one person to keep up a uniform current for more than one or two moments, on account of the extreme fatigue to the muscles of the hand in working it. Steam has been used, but of course is not always available, and has its obvious disadvantages. The hand air or force pump has been employed, but this also necessitates an assistant, even for the slightest operation. To obviate these and other defects, hydrostatic pressure* has been resorted to, and apparently with most satisfactory results.

"The apparatus consists of two closed cylindrical vessels (Nos 1 and 2), each capable of holding one or more gallons of water. On the side of each, close to the bottom, is a short tube (a and a'), with an aperture not exceeding five-eighths of an inch in diameter. At the top of each is a stop-cock (c and c') of one-eighth of an inch delivery. These apertures may be varied in size, according to the size of the vessels. The stop-cocks being closed, vessel No. 1 is filled with water. The two vessels are then connected by a flexible tube (a—a'), the larger aperture of the one with the larger aperture of the other. The atomizer (b) is connected by means of a small flexible tube with the stop-cock (c') of the empty or air vessel, No. 2. Elevate the vessel of water (No. 1) and open both cocks; the water will of course displace the air in vessel No. 2, and force it through the atomizer. Sufficient pressure is secured by an elevation of ten feet, and the height of an ordinary room answers very well. When the air has been entirely displaced in vessel No. 2, change the atomizer tube from No. 2 to No. 1, reverse the position of the vessels, and the fountain will be renewed without the escape of a drop of water. The principle here involved is familiar to all.



"In houses supplied with aqueduct water,

* Suggested by Mr. C. H. Hudson, of Roxbury, with whose co-operation the apparatus described in this paper was, after considerable experimentation, finally adopted.

the water-tube of the apparatus (a—a') may be connected with a hydrant, and thus one of the vessels be dispensed with—the air-vessel only being retained.

"All the effects of rhigolene, or concentrated ether, are secured by this apparatus. With rhigolene, the thermometer has been reduced from 72° above to 10° below zero, Fahrenheit, in ten seconds.

"The following are some of its advantages:

"1. By it a continuous, uniform, and equable current can be obtained at any time.

"2. Two or more atomizers can be employed at the same time. This is important where it is desirable to operate on a large surface at once.

"3. In an office, the whole apparatus can be constantly ready for use at the shortest notice.

"4. The current can be graduated to a nicety with regard to force, and be continued as long as required.

"5. It obviates the necessity of skilled assistants, without imposing upon the surgeon the distracting labor of manipulating the apparatus when his attention is required in the more important processes of an operation."—(*Boston Med. and Surg. Journ.*)

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"*Singular Molecular Changes in Metals.*—Take the alloy known as Newton's fusible metal, composed of eight parts of bismuth, five of lead, and three of tin; melt and pour it out upon a marble slab, and as soon as it becomes sufficiently solid to handle, break it by a slight blow. The act of breaking it by a blow upon one part, will usually cause the whole to fly into quite a number of fragments, like glass. Immediately afterward, the metal, which was easily handled before it was broken, becomes so hot as to burn the fingers, if taken up. When the evolution of heat has ceased, the alloy will be found entirely changed in character. From being extremely brittle, it will then require to be bent to and fro several times before it will break. The broken surfaces, which in the brittle state were smooth or conchoidal, with a tin-white color, will now be found to present a fine granular or crystalline surface, of a dark color, with a dull earthy aspect.

"Similar phenomena accompany the melting and cooling of the fusible alloy of H. Rose, which is composed of two parts of bismuth, one of lead, and one of tin. These facts were first observed and communicated to the public in 1842, by Robert Warrington, Esq., through the London Chemical Society. The fact of the evolution of heat from Newton's alloy, under other circumstances, had been previously alluded to by Berzelius, as follows: 'If this alloy is plunged into cold water, and quickly withdrawn and taken in the hand, it becomes sufficiently hot, after a few moments, to burn the fingers.' We presume the plunging into cold water was done before the alloy was cooled to the ordinary temperature of the atmosphere.

"These phenomena can only be accounted for by admitting a certain degree of mobility among the component particles, by which a second molecular arrangement takes place after the metal has solidified; this may possibly arise from their not having assumed, in the first cooling, that direction in which their cohesion is the strongest.

"That a very marked and extraordinary alteration in the characters and properties of various metals arise entirely from this change in the

position of their molecules, effected either by the communication or abstraction of heat after solidification, there can be no doubt. These changes, moreover, are applied to many very important purposes in the arts—such as the hardening and tempering of steel; the rolling of commercial zinc, and rendering that metal permanently malleable, the annealing of glass, cast iron, etc.—all of which processes undoubtedly depend upon the same principle as that involved in the curious phenomena above alluded to in the case of the bismuth alloys. A great variety of other uses, particularly in crystallization, might also be referred to."—(*Mining and Scientific Press* and *Drug. Circ.*)

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"*Annealing of Steel.*—We have often noticed that, after the smith had finished his work and wished to leave the steel or iron forging in a condition of sufficient ductility for the lathe workman or filer to operate upon, he would carelessly heat the forging, and either insert it into the ashes and coal-dust of the forge or heedlessly throw it upon the ground beside the anvil-block; consequently, when the turner or filer begins his work he finds it full of small hard spots, some of them exceedingly minute, and technically called 'pins,' which spoil the cutting edges of his tools and destroy his files. Finding it impossible to proceed further in his manipulations, he takes the unfinished article from the lathe or vice and sends it back to the forger to be reannealed and returned to him. We have seen this process repeated two or three times on some kinds of work, when a little knowledge and care would remedy the whole thing.

"In annealing, the steel should be heated slowly and carefully, as there is as much danger in overheating as there is in forging, and the whole article must be thoroughly heated through and brought to no higher temperature than a 'light-red' heat. If the article is long, like a spindle, it must be turned frequently in the fire, to prevent its warping or becoming sprung by the unequal expansion upon its sides; and at the same time be careful to heat it equally the entire length. The forger ought always to have an iron box of dry powdered charcoal by his forge, and in this quickly insert the article that is to be annealed, and cover it close with the coal-dust, so that the air cannot come to it, and there let it remain until perfectly cold and no sign of warmth be perceptible. If this is carefully done, the lathe workman or the filer will have no cause of complaint about 'pins' in the course of his operations.

"Some forgers bury the articles that they wish to anneal in powdered or air-slacked lime, cast-iron borings, and saw-dust, etc. These may answer a very good purpose, but they are in no way equal to the box of charcoal dust.

"There is another method called 'fire annealing,' that is practiced to some extent. It consists in heating the steel to a red hot, and then holding it in a dark place until a faint glow of heat is seen upon it, and then quenching the heat that remains in it in water. This may answer when there is need of the forging to be wrought upon immediately, but it is an operation that we do not approve of, and is not as effectual as the operation that we have described with coal-dust. Let any one who works in steel try the various methods, and they will give a hearty approval to the box of charcoal dust."—(*American Artisan.*)

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"*Tempering and Sharpening Steel.* By a MECHANIC.—Tempering a a tool consists commonly in giving it a hardness greater than required, and

then softening it by again bringing the metal to the action of the heat. This heating is variable, according to the softness required, and steel possessing then the faculty of covering itself with a very thin stratum of oxide of iron, the color of which varies with the degree of heat, the mechanic wants only to follow the indications of the thermometer for operating surely.

"At 430° F., pale yellow; 470°, gold yellow; 490°, brown; 510°, purple; 550°, bluish; 570°, indigo (blue); 610°, water green. Hence the expressions, to 'heat to a blue,' etc.

"As proved by your correspondent, 'I. E. E.,' the stratum of colored oxide is of no consequence to the temper. He removed it with diluted acid, and the former elasticity remained. He, like correspondent 'E. P. W.,' found that loss of elasticity resulted from the polishing and grinding of blades. The softening proceeded from the heat occasioned by grinding and polishing. By heating your blades again, you temper them more and more. By sharpening and using the tools, a great amount of heat is developed, and little by little the tools lose their hardness.

"I have seen many good carpenters, who rejoiced in having a planing-knife a little hard. 'It will soften by use,' they would say, and with reason, although, perhaps, not knowing why.

"For grinding, the stone should be dipped in water to prevent the heating of the tools; and careful cutlers use oil for polishing instead of water, when using grindstones of small diameter.

"Never follow the example of the street knife-grinder. He does much work, and cheap work. He uses as little water as possible. You give him a good razor or a good knife and he gives it back to you well sharpened, but a spoiled tool, which needs to be hardened anew.

"Therefore, when sharpening your tools, take large stones with much water, and make slow and good work."—(*Scientific American.*)

To Straighten Hardened Steel.—The *Scientific American* says: "To straighten a piece of steel already hardened and tempered, heat it lightly, not enough to draw the temper, and you may straighten it even on an anvil, if not really dead cold, by a hammer; but it is best to straighten it between the centres of a lathe, if a turned article, or on a block of wood with a mallet; where the article cold, would break like glass, warm it will yield readily."

"*Welding Mixture.*—Mr. William A. Sweet, of Syracuse, says in the *Scientific American:* 'I send you a recipe for using on cast steel in welding, and in restoring burnt steel. It is the best preparation that I have ever seen or used. One and a half pounds of borax; half a pound of sal-ammoniac; quarter of a pound of prussiate of potash; one ounce of rosin; one gill of alcohol and one gill of water. Pound fine, and boil in an iron kettle slowly, until it becomes a thick paste. Use as borax.'"—(*Druggists' Circular.*)

"*Soldering Solution.*—The following recipe is recommended for making a most excellent soldering fluid: Two ounces muriatic acid, in which as much zinc is dissolved as it will hold, to which add half an ounce sal-ammoniac. Clean the metal well and the solder will run and adhere to any part of the metal to which the solution is applied. It will also solder brass and steel together."—(*Ibid.*)

"*Tri-Silver—a New Coin Material.*—MM. de Ruolz and de Fontenay, of Paris, France, have obtained a new alloy, which may be very useful for small coin and many industrial purposes. It is composed of one-third silver, 25 to 30 per cent. of nickel, and 37 to 52 per cent. of copper. Its inventors call it *Tiers-argent*, or Tri-silver. The three metals, when melted together, form a compound which is not homogeneous, and it is only by a process yet a secret that a malleable metal is produced. In color it resembles platinum. It is susceptible of a very high polish, and is extremely hard and tenacious. It is not affected by exposure to the atmosphere, or by any but the most powerful reagents, and is without odor. It can be supplied at 40 per cent. less than silver, and its greater hardness will give it marked superiority. It may serve as a substitute for plated articles, but will be most valuable for small coin, from the difficulty of counterfeiting arising from the skill required in its preparation and coining."—(*Journal of App. Chem.*)

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"'*On the Action of Aqua Regia on Silver; New Battery.*' By M. Roullion. A mixture consisting of two-thirds hydrochloric and one-third nitric, or three-fifths hydrochloric and two-fifths nitric acids, will easily dissolve gold and platinum, but will only superficially attack pure unalloyed silver; a superficial chloride being formed, which protects the rest of the silver like an impermeable varnish, however long it may remain in the aqua regia. If copper be present, the metal is attacked. M. Roullion has utilized this fact to make a new battery in which pure silver in aqua regia replaces the platinum or carbon in the nitric acid of a Grove's or Bunsen's cell. He says that after several months' use the silver has not sensibly diminished in volume, and no chloride of silver has been found in the porous bell. He considers this battery more constant than Bunsen's battery."—(*Chem. News.*)

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"*Improved Mode of separating Silver from Lead.*—Hitherto the separation of silver from lead was a troublesome process, and did not afford a profitable return, when the quantity of silver was small. It has been found, however, that almost the whole of the lead may be removed by very simple and inexpensive means. After the metal has been brought to a state of fusion, it is run into a pan, and having been covered with small pieces of coke, a small jet of water is thrown upon it. The whole is then kept well agitated, which causes a uniform cooling; and when this has proceeded to a certain extent, the solid mass of coke and lead is removed. The residual fluid is extremely rich in silver, which may be separated in the usual way, at a comparatively small cost."—(*Intellectual Observer.*)

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"*Solubility of Iodine in Tannin.*—Iodine is known to be more soluble in water containing tannin than in pure water. M. Koller has found that to dissolve one gramme (about $15\frac{1}{2}$ grains) in 450 grammes (about $14\frac{1}{2}$ oz. Troy) of water at 120° F., the latter must contain 3.29 grammes (about 50 grains) of tannin. By raising the temperature, the proportion of tannin may be diminished. Pure water dissolves more iodine than water containing sugar."—(*Zeitschrift f. Chemie* and *The Chemist and Druggist.*)

"*Deodorization of Vulcanized Rubber.*—The offensive sulphurous smell of India-rubber goods is a serious drawback upon their otherwise great convenience. MR. STEPHEN BOURNE, an Englishman, has patented a process for removing this odor by treating the fabrics in a heated chamber with charcoal, and in preference, animal charcoal, as more rapid in its effect. The operation may be conducted simultaneously with the vulcanizing, the apparatus required being very simple."—(*Sci. Amer.*)

Peat a Substitute for India-rubber.—The *London Engineer* states that "an English patent has been taken out by which picture-frames, book-backs, card-paper, mouldings, and decorations for furniture, brick for building purposes, fronts for stores and dwellings, and all other purposes in which bone, India-rubber, and gutta-percha are component parts, can be manufactured from peat."

BIBLIOGRAPHICAL.

The Functions and Disorders of the Reproductive Organs in Childhood, Youth, Adult Age, and Advanced Life, considered in their Physiological, Social, and Moral Relations. By WM. ACTON, M.R.C.S., late Surgeon to the Islington Dispensary, and formerly Externe to the Venereal Hospitals, Paris; Fellow of the Royal Medical and Chirurgical Society, etc. etc. Second American from the Fourth London Edition. Philadelphia: Lindsay & Blakiston, 1867.

This well-known work treats of a subject of great importance to the physical and moral well-being of the human race. Its character and scope are sufficiently indicated by the title. It presents much practical information on the functions, disorders, and treatment of the reproductive organs, and may be consulted with profit by physicians, teachers, parents, and others interested in the welfare of society.

Index of Diseases, and their Treatment. By THOS. HAWES TANNER, M.D., F.L.S., Member of the Royal College of Physicians, etc. Philadelphia: Lindsay & Blakiston, 1867.

Practical Therapeutics, considered chiefly with reference to Articles of the Materia Medica. By EDWARD JOHN WARING, F.R.C.S., F.L.S., Surgeon in Her Majesty's Indian Army. From the Second London Edition. Philadelphia: Lindsay & Blakiston.

These works have been prepared with special reference to the wants of those who require a concise view of diseases and their remedies without being obliged to consult the more elaborate treatises to meet the exigencies of practice. They afford a condensed summary of practical medicine, and are well adapted to the needs of the busy practitioner. Though by different authors, they are complemental to each other, for while the first gives a classification of diseases and an outline of their treatment, the second treats more particularly of the medical properties of remedies and the disorders to which they are applicable. Such books are valuable adjuncts to the physician, and should be in every professional library.

The paper, typography, and binding are in the usual good style of the publishers.

THE

DENTAL COSMOS.

NEW SERIES.

VOL. VIII. PHILADELPHIA, MARCH, 1867. No. 8.

ORIGINAL COMMUNICATIONS.

UNSUCCESSFUL CASES.

BY J. H. M'QUILLEN, M.D., D.D.S.,

PROFESSOR OF ANATOMY, PHYSIOLOGY, AND HYGIENE, IN THE PHILADELPHIA DENTAL COLLEGE.

In the practice of medicine, surgery, and dentistry, there is always a disposition manifested on the part of practitioners to speak freely (and sometimes to write out extended descriptions) of successful cases, claiming, in addition, not unfrequently in the most complacent manner, entire exemption from failures; while, on the other hand, there appears to be a general disinclination to speak of, let alone report those cases in which the results prove unfortunate. Acting upon the principle that "dead men tell no tales," all reference to such cases are studiously avoided. And yet the citation of them would be among the most valuable and instructive contributions which could be made to the literature of the profession, for they prove that even with the greatest care and the employment of every means that an extended experience suggests, unsuccessful results supervene in the hands of *all*. For although some may claim an entire exemption, they only do so from the fact that they forget their unfortunate cases, and perhaps know nothing of the history of others which have passed into the hands of fellow-practitioners.

As an illustration, the following case may not prove uninteresting.

A young lady came to me recently with her teeth in a condition that demanded an extended series of large and difficult operations. Among them was a right inferior second molar which had been filled near to the pulp some time back by a fellow-practitioner. The tooth being tender when subjected to variations of temperature, and the filling defective, the latter was removed, and the pulp cavity found open, with a slightly devitalized pulp, although sufficiently sensitive to demand the arsenical application. This was made with the greatest care, and the cavity sealed. On the following day the pulp was thoroughly extirpated without any un-

pleasant sensations on the part of the patient. The usual dressing was applied, the roots filled with cotton, the cavity with Hill's stopping, and the patient dismissed for a week, at the expiration of which time she returned complaining of a slight soreness in the tooth on closing the jaws. The dressing was removed, the pulp cavity freely injected with water, the gum scarified with the lancet, the dressing renewed, and the patient dismissed very much relieved. The tooth remained comfortable for two or three days, when it again began to give trouble, the gum becoming very much inflamed, particularly posterior to the tooth. I felt satisfied by the general appearance that the wisdom tooth was endeavoring to erupt, and on making a crucial incision through the gum, the correctness of the diagnosis was verified, and for the time afforded decided relief to the patient. On the next day the gum was again found quite inflamed, and the necessity of thoroughly uncovering the crown of the wisdom tooth by dissection of the gum being apparent, it was promptly done. This removed all source of trouble, so far as that tooth was concerned, but a persistent and troublesome periodontitis had by this time become established in the second molar, which the most careful treatment failed to completely subdue, notwithstanding the employment of the most reliable local and general antiphlogistics, combined with syringing the pulp cavity with water, and relief from pressure by the use of caps on the teeth of the opposite side. After some weeks of varying success it was decided to remove the tooth, as the patient was on the eve of taking a voyage to sea, and feared an attack of pain while on shipboard. But for this, the tooth, perhaps, in the course of time, might have been saved.

As an evidence that the exciting cause of trouble was the eruption of the wisdom tooth; at the same time that this tooth was under treatment, the pulps of three other teeth, the right and left upper, and left lower molars, were also found exposed, treated with the arsenical paste, pulps extirpated, and teeth filled with gold, without the slightest untoward symptoms.

MICROSCOPY OF THE TEETH.

BY S. P. CUTLER, M.D., D.D.S., HOLLY SPRINGS, MISS.

(Continued from page 310.)

In my former communications I have given the histological anatomy of dentinal tubuli. I shall now speak of the contour lines of Owen. In a drawing taken from Kölliker, in the Dental Cosmos, the contour lines are represented in the dentine in the crowns of teeth running into the enamel.

In all the specimens I have examined, I have not noticed these lines in a solitary instance in the dentine, either in the crowns or neck of fang. I have seen them only in the cementum in the necks of deciduous

or young permanents, in the form of concentric rings, very smooth and regular, being very close together at the centre surface for a short distance inward, then further apart, but regular distances apart, until near the inner surface, where they become closer again, and cease at the dentine altogether.

There is another phenomenon I have not seen described by any one—that is, a striated appearance, or dark wavy lines, in the crowns running across the tubuli, which are readily seen in thick specimens, but disappearing entirely in thin specimens. These cannot be considered contour lines.*

I shall not speak of the interglobular spaces at present, as they are the subject of professional controversy. In my former communications, I have given the microscopy of sound dentine. I will now give the microscopy of morbid or pathological dentine.

There are three distinct forms of decay well known to the profession—namely, the black, brown, and the white, the brown occupying a middle position. This form of decay is unlike either of the others in a marked respect. In this variety, the fibrous portion, up to a certain stage, is intact—that is, adherent to the sound dentine below, nothing but the lime having been removed by disease. This animal or fibrous portion retains its vitality or sensibility to a greater or less degree, until the decay reaches the pulp cavity. In many cases the sensibility remains very acute, and gives sharp pain on the slightest touch of the excavator.

This brown substance is easily removed, generally peeling off from the sound dentine below, leaving a smooth surface. This substance is easily cut with a sharp instrument, and may be readily sliced up into microscopic specimens. These specimens, when examined, present almost exactly the same appearance as the sound dentine, with some exceptions, the transparency being nearly the same under the instrument, but to the naked eye it is a dark-brown. In portions the tubuli are normal; in other portions of the same specimen, changes have taken place. Immediately around the tubuli, in some portions, there are darker and lighter spots, during the course of the same tube, owing probably to the fact that the lime immediately enveloping the tubuli is closer than in the intertubular spaces, and not as readily removed by chemical action; and where the process has not been complete, portions of this envelope remain intact, giving the dark shade mentioned above. In other portions, where the process has been more complete, the tubes present their normal appearance. Near the union of sound and diseased dentine, the dark envelope is predominant to a greater extent than at the outer surface of the decay, where most generally the lime salts have entirely disappeared, leaving the tubes apparently natural.

* The lines thus seen are contour lines.—J. H. McQ.

There is another phenomenon to be spoken of in this morbid dentine—that is, a corroded condition of some of the tubuli, which obtains in the more advanced stage of the decay, as they are found most frequent where the process is more complete. These corrosions are always found following the course of the tubes, and never in the intertubular spaces. These corroded spots are sometimes found in the middle regions of the tube, not extending to either termini, though most generally they commence at the surface of the decay, and follow down the tube so affected.

These corrosions are seen in all stages in the same specimen, varying from the natural size to that of some three or four times larger. Instead of being smooth and regular, like natural tubuli, they have a beaded or worm-eaten appearance, resembling somewhat a succession of blood globules, arranged in a continuous line in contact, some of the more advanced near the size and shape. I have never seen two contiguous tubuli so corroded. In some instances, there is but a solitary one; in other regions, two, three, and sometimes more—all about equidistant apart; always as many as three intervening tubes uncorroded.

In some portions, there may be noticed slight corrosions in all the tubes, never running into the advanced stage before mentioned. This phenomenon has no doubt been brought about by chemical action, after the secondary stage has been attained by endosmosis, or absorption into the open tubes, after the death of the nerve filament, of chemical agents capable of producing the above described condition. This subject needs further investigation, and is a subject of importance to the profession, and one but imperfectly understood as yet. This form of decay is peculiar to certain teeth and conditions of the mouth in the same individual. Some persons never have this form of decayed teeth; others again never have any other form at certain periods of their life. I may speak of this subject again.

Specimens prepared from teeth that have been burned in the fire until all the animal substance has been removed, or by the action of caustic potash, present the tubuli nearly as perfect as the sound dentine, with some slight exceptions. The tubes in these specimens in portions have a darker shade than in others; with this exception, no apparent change has taken place, though the tooth has lost a large portion of its weight. To the naked eye, it has a chalky appearance.

The tubuli in the ossified nerve cavity, caused by natural wear of the crown from friction, need a separate description. These tubuli are apparently a continuation of the tubes that occupy the natural dentine, though they differ in some respects. Instead of observing the same regular course, they are irregular, and full of short curves, not governed by any regular order or system, resembling more the tubes in the lower fang than those in the crowns.

These tubuli are, as above stated, no doubt continued inward and

downward as the wearing process goes on, and continue so long as the wearing process continues, ceasing when the wearing away ceases, and again resumed whenever that process is resumed; always commencing when the process has approached within a certain distance. This is a wise provision in nature, otherwise old persons could not chew at all, and would be subject to constant pain and suffering. When this process has been too rapid, as in cases where a good many teeth have been lost, destruction of the nerve is frequently the result. Teeth become sensitive frequently, and have to be rested for a few days, until the setting process is perfected. Dentists are frequently consulted by elderly individuals, concerning this condition of their teeth. The remedy is rest of the organs. I shall speak of this process again, under the head of physiology and pathology.

(To be continued.)

SURGICAL DEPARTMENT OF THE PHILADELPHIA DENTAL COLLEGE.

Under the charge of James E. Garretson, M.D., D.D.S.

CLINIC REPORT.

BY H. L. GILMOUR.

Cases First and Second. Tumors of Lower Jaw.

Here, gentlemen, are two little girls, each presenting herself with a tumor situated on the side of the lower jaw. Each tumor is of several months' standing, and slowly increasing in size; each feels to the touch perfectly solid, and each is without pain; they seem as if the bone was expanded beneath the gum. On looking into the mouth I find badly diseased teeth associated with the tumors, and on passing the exploring needle into the body of the growths, it seems to cut its way through spongy bone. This form of tumor is quite common in the mouth, and the treatment is simple and effectual.

The irritation caused by the presence of the diseased teeth induces an hypertrophy of the cancellated structure of the parts—an enostosis, if you please. The natural course of this is either finally to ulcerate, or otherwise remain as a permanent tumor; more commonly the latter, according to my experience. In size, it seldom exceeds the half of a walnut, and always gives much more mental than physical disquiet. The exploring needle will generally give the diagnosis, diseased teeth being not always observed in the connection; that is to say, a tooth may, years before, have been broken off in efforts at extraction; the root, or only some insignificant portion of it, being left buried in the alveolus; but this piece of root, it will be found, is the source of the tumor. I have treated such cases, where the offending agent was a piece of tooth-root not larger than the

head of the ordinary hare-lip pin. One fact in this connection is not, however, to be overlooked by you.

In nine cases out of every ten, a little fistula will be found discharging in the neighborhood; it will be very small, and must be looked for carefully; pass a probe into this, and it will lead you to the seat of trouble.

To cure these tumors, first we remove the cause. The extracting of the tooth or root is not unfrequently all that is necessary,—not always, however; it will depend on how the alveolus closes; if speedily, and without suppuration, then the tumor will not be cured; if by suppuration, and this continued over several days, or it may be weeks, then the parts will get well. In these cases now before you, I will first extract the offending teeth, and then, with a delicate gouge, cut away, through the tooth socket, the spongy mass; this, as I now show you, is most easy of accomplishment. I chisel off the mass, piece by piece, cutting away all the growth through the tooth socket, and the wound I leave, I would have you observe, is not a jot worse than is made every day in the dental department in the extraction of bad teeth. In two weeks I will again show you these little girls, perfectly well. If, as the result of the operation, any inflammation of consequence comes on, they must each be given a full dose of sulphate of magnesia.

Case Third. Here is a young man who has been under my care, more or less, for the past two years. As the result of a blow received a long while back, the right nares is completely obliterated, the cartilaginous portion of the septum narum lying against the right ala. This patient first applied to me for relief from nasal hæmorrhage, which was so continuous and profuse as to unfit him for the discharge of his daily duties, the hæmorrhage being associated with ulceration of the septum; from this bleeding he had suffered for years, finding only temporary relief from the many expedients resorted to. He has now had no hæmorrhage for eighteen or twenty months, and has it held completely in check, by taking each week only two or three drops of tinct. erigeron canadense. This seems very wonderful, and I would think there were other reasons for the relief, if I had not satisfied myself by experimentation that to the erigeron belongs the credit. I advise that you take a note of this; it will, no doubt, some time be found useful.

To treat any ordinary venous or capillary hæmorrhage, give it in drop doses, one drop each minute, in a little water.

The patient is now complaining of a constant sore feeling in his nose, and of inconvenience in breathing. These annoyances have always troubled him, but being secondary in importance to the hæmorrhage, it is only on getting relief from the first that he has been anxious that I should try and cure him of the others. This I propose to do this afternoon, by cutting away all that portion of the septum lying against the ala.

The patient was here etherized, and the cartilage cut away with a tenotome. The hæmorrhage, which was very profuse, was only controlled by plugging the nares. Quiet, and tinct. erigeron prescribed.

CASE FOURTH. An elderly lady applied to have an upper set of teeth made, but on examining the mouth, there was observed to exist adhesions of the alveola-labial mucous membranes, obliterating the alveolar margin of left side and extending from the position once occupied by the first bicuspid tooth back to the tuberosity.

The operation in this case consisted in cutting the adhesions, and a student was instructed by the doctor how to make a gutta-percha plate, which was to be applied for the purpose of preventing the reunion of the separated surfaces.

(To be continued.)

FILLING TEETH.

BY H. SCOTT, LANCASTER, OHIO.

IN the DENTAL COSMOS for April, is a paper by C. E. Latimer, D.D.S., of New York, under the title, "Prevention of Dental Caries," which in the main has my most cordial approval. There is one point, however, upon which I beg the doctor to excuse me for the liberty I take in dissenting from his views.

At the beginning of his third paragraph, he says: "*I am often asked how long I warrant my work; * * * but I tell all such inquirers that I never warrant my work for a moment.*" Now, if this remark of the doctor's is never to be read by others than the profession, it is of the less consequence. And yet, undoubtedly it is better that dentists (especially the younger members of the profession) should feel the highest responsibilities devolving upon them, and exert themselves accordingly. I must ever hold that an intelligent understanding should in all cases be established between the operator and his patient, to the end that mutual confidence may be secured and maintained. Who, of all that call upon the dentist to aid them in saving their teeth from destruction, after having paid him for his services, could feel that there was anything to be secured by the expenditure of pain and money, if they were uniformly dismissed with, "*I never warrant my work for a moment*"? People want reliable assurance upon all matters of interest or cost to them, where they are incapable of judging the whole matter for themselves. Such assurance the dentist is capable of giving.

Teeth possessing ordinary health (after about the eighteenth year of life), if taken in hand while the cavities are small, may be filled with gold, as every experienced operator will agree, so as not only to arrest caries, but to entirely prevent its further extension at that point. And

upon the subject of warranting I shall hold, that where a filling drops out from sheer want of skill, or proper care in placing it in the cavity in accordance with possibilities, the dentist is morally bound to replace it by a new operation, without fee; provided that its loss has not been caused by accidental force, or the wearing away of the tooth by attrition. This kind of warranty might not be understood to extend beyond a reasonable time—say five to fifteen years, according to the general health and state of the teeth.

That teeth do subsequently decay at other points, all know, and hence the doctor's suggestions are well put, that patients who neglect to see their dentist frequently, do so at their own expense; but nothing in this neglect is to be so construed as to excuse the operator from doing what he does do in a durable manner. I am to be understood as speaking only of filling ordinary cavities, that have no complications. I have devoted a full quarter of a century to this branch of our profession, at this one point, and it occurs to me sometimes to have occasion to extract molars with one to two and three gold fillings that I had placed in them from ten to twenty years previous, and which remain in every respect as when they passed out of my hands. I could well afford to warrant such fillings; but I could feel no responsibility for the consequences my patients brought upon themselves by staying away until caries had extended into the necks of their teeth, from corroding agents that had been suffered to remain between them for years, and which at last drove them back to seek relief by the removal of teeth no longer worth the attempt at saving.

Suppose we agree upon an understanding, that proper teeth to fill can be filled and placed beyond danger, so far as the point operated upon is concerned; and then, as to our workmanship, and the arrest of decay as far as we have gone, give our patrons the proper assurance, and thus widen and elevate the public appreciation of the utility and blessings of dental science.

I have been chided by some brothers for one of my habits; but it has conferred far more advantage to me than to my patients. It is this—I have given to every one of my patients, during the last sixteen years, a printed blank, filled out by marking opposite each tooth, in the order of their classification, the number and position of my gold fillings. I do this for private reasons, one of the most important of which is, that I work in many mouths where other dentists have, and I want to be able to know my fillings. If one of these comes to me out of order, I do what I think is right in regard to charging, under all the circumstances. In this way I have a good understanding with my patients, and a pleasant and remunerative business.

POLYPUS OF THE ANTRUM.

BY GEO. S. FOUKE, WESTMINSTER, MD.

MAY 15, 1866, Mrs. R——r, *æt.* 50, consulted in reference to a severe affliction seated in the head, which had for a long time baffled the best medical treatment.

The lady suffered usually with a severe pain in the left side of the face and head. Her appearance indicated much mental and physical debility; countenance pale, with a dull expression of the eyes; quite nervous. Her medical treatment had been for "neuralgia."

No evidence at all that the teeth could give rise to the malady. There was but one tooth remaining in the left superior maxillary in the rear of the cuspidatus; and this was a large molar occupying a position near the tuberosity of the maxillary bone. The tooth, the gum surrounding it, and the entire left side of the mouth were in a healthy condition. But, as the suffering proceeded from the left side of the face, I determined to remove the only remaining tooth, thinking it might be the obscure cause of the trouble.

The force intended to luxate the tooth was applied with care; but the tooth gave way almost with the touch of the forceps. The effort to remove the tooth revealed the fact that the entire alveolus surrounding the triple fangs, and the tuberosity, were destined to come with the tooth.

Upon removing the united mass, a peculiar substance was noticed at the posterior surface of the maxillary bone. It was of a pale yellow color. I seized hold of this and drew it out. The appearance of this growth struck me as corresponding with the descriptions I have read of polypi in the antrum. It was a soft, smooth substance, one-quarter of an inch in diameter at the base, and over two inches in length, tapering to a point. The color at the base was pale yellowish; toward the apex it became of a pink or purple color.

It is gratifying to say that the lady has found relief and restored health from the removal of the morbid growth, be that what it may.

IMMEDIATE INSERTION OF TEMPORARY TEETH.

BY A. L. STEPHENSON, NORTH MANCHESTER, INDIANA.

I HAVE been experimenting for some time on the insertion of the temporary teeth immediately after the extraction of the natural ones, and I find that the barbarous practice of taking the impressions of the lacerated gums can be entirely dispensed with.

My plan is this: before a tooth is extracted, take the impression, obtain the model, then the antagonizing impression, and fasten in the articulator. From the model trim off the teeth that represent the natural ones to be

removed, and smooth down the parts that will be rendered soft and spongy by extraction.

In this manner the temporary teeth can be accurately fitted before a tooth is extracted. After the artificials are mounted, extract the natural teeth they are to replace, and they may be inserted as soon as the gums quit bleeding. The advantage this method has over the ordinary one is obvious, as the plate supports and protects the thin edges of the alveoli during absorption.

PROCEEDINGS OF DENTAL SOCIETIES.

PROCEEDINGS OF THE ODONTOGRAPHIC SOCIETY OF PENNSYLVANIA.

BY THOS. C. STELLWAGEN, D.D.S., A.M.

A MEETING of the Society was held Monday evening, February 4th, 1867, at the Philadelphia Dental College.

The President, Dr. Jas. M. Harris, in the chair.

The minutes of the previous meeting were read and adopted.

Prof. F. V. Hayden, M.D., was unanimously elected as an honorary member.

A communication from Dr. A. Lawrence, of Lowell, Massachusetts, was read.

Prof. McQuillen, by the request of the Society, then exhibited and briefly described some papier-maché representations of the organs of digestion of different animals; being a portion of a very valuable collection, illustrative of the comparative anatomy of the organs of digestion, respiration, circulation, and innervation, lately imported by him from Paris.

In the course of the remarks, he said to properly appreciate the process of digestion in man, it is necessary to become acquainted with the modifications presented in the digestive organs of the animal kingdom. In the lowest order of animals the stomach constitutes a mere sac, and the variety of forms which are presented in the alimentary canal of other animals are but modifications of that. In this manikin of a man, the entire alimentary canal is represented, with a stomach resembling in shape a bagpipe, and in form and simplicity of structure, it is somewhat analogous to that of this lion, which as a carnivorous animal, lives upon food, comparatively speaking, easy of digestion. The difference in size between them and this stomach of a horse is quite apparent, and, feeding as it does upon a vegetable diet in which the nutritive materials bear a very small proportion to the entire mass, a large and capacious cavity is required, and, in addition, there is an evident tendency toward the com-

plexity of structure which finds its full development in the ruminant animal as shown in this stomach of a sheep, which is divided into four distinct compartments, the first of which is the largest, and called the *paunch;* the second, the bonnet or *honeycomb* membrane; the third, the *manyplies*, from the numerous folds of the mucous membrane; the fourth, the *caullet* or true stomach; in the latter of which true digestion takes place. When brousing and first swallowing its food, the bolus passes along the œsophagus into the *paunch*, where it remains a short time, and then small pellets are passed into the *honeycomb*, from which, by a retrograde movement, it is thrown along the œsophagus into the mouth to be rechewed as a cud, after which it is reswallowed, and by a peculiar arrangement of the lower portion of the œsophagus, passes directly into the *manyplies*, where, after remaining a short time, it eventually enters the caullet. In this stomach of a rodent or gnawer, a rabbit for instance, an illustration is presented of a departure from a simple form of stomach, for by a peculiar hour-glass constriction, it is divisible into a splenic and piloric portion. (The relation which the teeth hold to the food and the stomach in the mammalia was touched upon.)

Passing from the *mammalia*, the peculiarities presented by birds are interesting; here, for instance, is the digestive apparatus of a chicken, at the upper portion of the œsophagus, is the large expanded cavity known as the *crop*, where the grains which the animal picks up remain for some time, and are softened by intermixture with the secretions of the lining membrane. Some distance below this another expansion is observable, the proventriculus, and beyond this again the gizzard or masticating stomach of the animal is found; the walls of this are formed by four large muscles, while the interior of the cavity is lined by an exceedingly dense and calcareous structure. The instinct of the animal prompts it not only to secure its food, but also to pick up small gravel stones, etc., which on being swallowed and passing into the gizzard, serve as supplementary teeth in the reduction of the grain to powder. In contradistinction to this granivorous bird, observe the difference presented by the stomach of a carnivorous owl, which, feeding entirely upon animal food, in place of a gizzard has a stomach, whose muscular walls are, however, well developed. We will now examine the stomach and intestines of fishes, taking as an illustration this of a dog-fish. The stomach in this instance is markedly divided into two distinct cavities, while the intestines are found to present externally the appearance of a perfectly straight tube. But by the peculiar arrangement of the mucous membrane the interior is thrown into numerous spiral convolutions from above downward, by which the extent of absorbing surface is very much increased. In the *articulata*, this crab, for instance, the stomach is supplied with organs which serve the purpose of teeth and are actually used for the reduction of its food; while in the grass-

hopper, which feeds upon vegetables, an arrangement is presented somewhat like the gizzard of the fowl. In conclusion, here is a specimen of one of the *mollusca*, the cuttle-fish, with its mouth supplied with beak-like jaws analogous to the parrot-fish.

Prof. Harrison Allen followed with some general remarks upon the variety of alimentary canals in the animal kingdom, calling attention to the fact that they are all modifications of the lowest form (a plain tube)· the stomachs, etc. being sacculated portions. He considered this opportunity a rare one for the study of the comparative anatomy of the organs, as he did not think there was another equally perfect collection in this country.

On motion, it was resolved that Dr. T. B. Gunning, of New York, be invited to address the Society in relation to his Interdental Splints for the Treatment of Fractures of the Lower Jaw, on Wednesday evening the 13th, 1867.

February 13th.

A special meeting of the Society was held February 13th, 1867, at the Philadelphia Dental College.

Dr. Jas. M. Harris in the chair, Dr. S. S. Nonis acting as Recording Secretary, *pro tem.*

The Corresponding Secretary stated that he had received a letter from Dr. Gunning, regretting his inability to be present at the meeting, but forwarding a number of casts and the apparatus illustrative of his Interdental Splints along with a paper descriptive of them, and an essay, published some time since in the *New York Medical Journal.*

After these had been presented to the Society, it was moved that the papers be published in the Transactions of the Society, and a vote of thanks tendered to the author for his kindness in forwarding the apparatus.

TREATMENT OF FRACTURE OF THE LOWER JAW BY INTERDENTAL SPLINTS.

In the year 1840, when treating the first fractured lower jaw placed in my care, I found treatment by bandages, etc. unreliable. For, while the muscles tend to displace the bone, bandages frequently increase the difficulty; especially when swelling sets in through their pressure. They also, by interfering with the circulation, tend to prevent union. Teeth, loosened by the injury, are left unsupported, and the motions of the jaw, cheeks and lips painfully restricted.

Of the contrivances invented to supplement bandages, many were even more objectionable, and little improvement has been made in general treatment up to the present time Having successfully used interdental splints, in many cases which had proved unmanageable under the usual treatment, I am convinced that they are superior to all other appliances.

When a well-adapted splint is on the teeth and gum, the other parts around the bone are, to a great extent, a counter-support to the splint. Thus the broken jaw, together with any teeth loosened by the injury, is

held securely in place, until the fractured bone is reunited and the teeth become firm. Meanwhile the motions of the jaw are in most cases unrestricted and the cheeks and lips always left free.

The best time to commence fitting a splint is immediately after the injury, if the condition of the patient will allow. If the fracture is old and has been treated by bandages, and there is much displacement of the fragments, with swelling of surrounding parts, it may be advisable to leave it *free* for several days.

When the fracture is not quite recent, pain and stiffness may prevent the patient from opening the mouth sufficiently to apply a splint, in which case the operator should force the jaw steadily downward with his fingers, assisted by wedges of wood, etc. This may be very painful to the patient at the time, but the movement of the parts will be followed by great amelioration of the pain and stiffness. Hooks, forks, and strings, applied to the teeth, will manage the fragments with less suffering to the patient than handling the inflamed muscles. The fragments of the jaw should be set and held by wire, packthread or silk, passed around the teeth. If the teeth are so formed that the ligature slips off, it may be carried through the gum with a needle. When a fragment of the jaw falls below the one next to it, a ligature of wire should be fastened around the neck of the lower tooth, two eyes being made by twisting the wire, before applying it. Another wire should be fastened around the neck of the elevated tooth, and both ends brought up on the side furthest from the fracture, over the crown, down through the eyes before mentioned, and then tightened until the bone is in place. Or the wire may be fastened to a tooth further back, and then pass over the crown, etc. On this principle, ligatures may be applied to the teeth laterally to bring the fragments into line. A jack-screw, furnished with points, forks, and collars, is frequently necessary to extend the fragments, but in some cases it can be done by a piece of wood. The jack-screw should be made to turn by its centre, and the points, forks, etc. fitted into sockets, that they may be left still when the screw is turned. This instrument may be used across the mouth to keep out any back fragment that falls in, or more in front to extend oblique fractures. In fractures behind the canine when the back fragment comes forward over the front—being allowed to do so by the absence of teeth and the direction of the fracture—the jack-screw, with a point in the front fragment and a fork in the back one, will be found very useful in making extension. One fitted with hooks, to draw in the jaw by inserting both hooks near the external oblique lines, or in any required positions, will be found indispensable in some cases. A piece of hard wood forced in between those teeth which fall toward each other, and to which it must be fastened with fine iron wire, will frequently give the needed extension. When the jaw is broken between the canines, with the fragments smooth and the parts around allowing them to go in any direction, there is frequently a front tooth absent, through the fracture, or by shedding, etc. In this case a piece of moderately hard wood may be fitted in the vacancy. It should be so wide that the adjoining teeth will press into its sides, when they are wired tightly. If this is well done the bone will be firmly set. Should the teeth in question need support, they may be wired to those adjacent.

An impression of the parts should be taken in pure yellow wax, warmed by *dry* heat. But in comminuted fractures there may be portions of the jaw and teeth for which plaster of Paris would be better, but it must be

applied in sections. The wax should be applied in a mouth-cup adapted to the jaw. No. 4 splint is precisely what is required for this purpose. (Some useful hints may be found under that head.) If fracture should occur in a jaw without teeth, plaster would be much the best. It should then be applied in a cup to all parts of the jaw at one time. If possible (and it is rarely otherwise), an impression of all the teeth and gum, *properly set*, should be taken at one time. The wax in coming off will then draw or enlarge in the right places, and the plaster-cast from it will be precisely what is required to mould the splint, excepting the addition caused by the ligatures.

If the bone cannot be held in place, an impression of each fragment should be taken separately, and the casts from these impressions united by plaster in their proper relative positions. A cast of the upper teeth will sometimes guide in doing this. The united cast must be enlarged under those parts of the teeth which overhang. But when the pieces of the jaw can be held *nearly* in place, an impression of all may be taken at one time, the cast separated where necessary, and then adjusted as above.

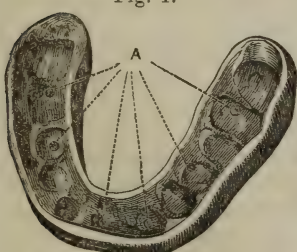
By adopting this method, when there is little displacement, the jaw may be left unset until the splint is applied. When adjusting the cast, care must be taken that it is not made too small for the jaw and teeth as a whole, or for any tooth individually. There is little chance of getting it too large, as far as the teeth are concerned.

On February 12, 1861, I applied a "hard vulcanized rubber splint" to the fractured jaw of a seaman in the United States Naval Hospital, and from the vulcanite splints used by me since that time I have selected three which show all that is essential to hold any fractured lower jaw in place.

The fourth, a metal splint, is sufficient for the treatment of most cases, and can be applied by surgeons and country practitioners, who can also treat most cases of fracture with rubber splints, if assisted by the neighboring dentist. But a severe fracture may occasionally be met with, which will require either a specialist or an accomplished dental surgeon.

Fig. 1 represents the inner surface of a splint which incloses all the teeth and part of the gum of the lower jaw, and merely rests against the upper teeth when the jaws are closed. This splint is adapted to the treatment of all cases which have teeth on both sides of the fracture, except those with *obstinate* vertical displacement.

Fig. 1.



The holes marked A go through the top of the splint for the purpose of syringing the parts within with warm water during treatment. The dark round spots in all the cuts represent holes for similar purposes.

The angles of the jaw tend outward, when the jaw is fractured through the body. It is therefore necessary that the splint should go down and extend back as far on the outside as the muscles admit, especially on the short fragment, if there is much difference between them. The parts near the external oblique line are so formed that the splint can be fitted to them perfectly. The outer ends of the splint should be quite thick, so that they may be well rounded.

When the gum on the inside is so overhung by the back teeth as to afford but little bearing for the splint, the latter may be cut off, generally at or just below the edge of the gum, for there is rarely any tendency of

the jaw to fall in at its lower border. The splint should not extend into the muscles unnecessarily in any part.

When the jaw is fractured in or near the front, the digastric and other muscles, inserted on the inside near the symphysis, draw the bone backward and downward. This splint neutralizes the first by holding the sides of the jaw *in*, which prevents the arch in front from falling back.

The tendency of the jaw to widen at the angles and to fall in at its upper border, so that the points of the canines approach each other, is also counteracted. The splint goes down about half way (on the outside) from the points of the teeth to the lower border of the jaw, and all the surfaces of the teeth and the outside of the gum are held by it, while the condyles and their interarticular cartilages are so far above the lower edge of the splint that their leverage prevents the sides of the jaw from being turned outward by the muscles inserted near the symphysis.

This must be effectual so long as the splint is down in its place; and even when the fracture is back of the canine, and the four pairs of muscles are acting upon the front of the jaw, there is little chance that they will draw it down out of the splint, as they act in sympathy with the elevator and other muscles attached to the bone, when the *splint is on and the jaw allowed to open and shut.*

There is also, in recent fractures, a roughness of surface, which prevents the fragments from moving when held close together. But if the fracture is so old that the fragments slide past each other, especially if the back one slants away and affords no support to the forward one, it *may* be necessary to hold the latter up by a screw passing through the splint into the canine or some other tooth, near the depressed end of the bone. That horizontal displacement which frequently follows fractures near the canine and lateral incisor teeth, in which the front of the jaw is drawn back by the muscles inserted near the symphysis, leaving the end of the short fragment in determined projection, and in which the treatment by bandage and ligature is not only useless but pernicious, is effectually overcome by this splint, without screws. A large proportion of all fractures may be successfully treated in this way. When a *very* loose root or tooth is present, it may be advisable to remove it before application of the splint. Rarely so before the impression is taken, as they are frequently of use in holding the jaw.

I have generally used this splint without any fastenings, but in children or even adults it is sometimes advisable to secure it by packthread, wire, screws passing into or between the teeth, or by the wings and band of Fig. 4.

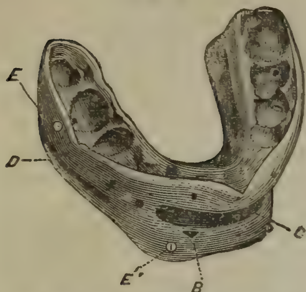
Fig. 2. *In cases with obstinate vertical displacement*, the splint, in addition to fitting the teeth and gum of the lower jaw, must also inclose the upper teeth, as shown in the cut, where screws may be seen opposite both lower and upper teeth.

By this arrangement the fragments of the lower jaw are secured, not only relatively to each other, but also to the upper jaw.

This splint is therefore adapted to the treatment of *all fractures back of the teeth*, whether in the body, the ramuses, or their terminations. In these cases the splint may be cut away in front, and extended across the roof of the mouth, when there are upper and lower back teeth to fasten to, and thus give as much room as possible to speak and eat through. Opening the teeth a quarter or three-eighths of an inch would not have any bad effect on the position of the fragments, even if the jaw were broken

through the necks of both condyles, as the parts near the fractures would move but little and the back of the jaw could be raised high enough to keep the broken surfaces in contact. Even if the neck of one side only were broken, the lower part could be kept firmly up against the fragment above. In fracture of the ramuses no difficulty would arise from this course. If a coronoid process were broken, this plan would give as good a chance for union as any. In fracture of the angle, this process would be likely to hold the parts in contact. If it did not, a wing could extend out from the splint and pass back from the corner of the mouth to hold a pad, etc. against the part requiring support; it could rest on the zygoma, or the mastoid process, if necessary.

Fig. 2.



B, triangular opening, of which one side corresponds to the cutting edge of the lateral incisor, which tooth stood in the end of the fragment most displaced before the splint was applied. C, opening for food, speech, etc. D, channel for the saliva from parotid gland to enter the mouth, its fellow being seen on the other side of the splint. E′, screw opposite lower canine tooth, head of the left screw being just discernible. E, head of screw opposite upper first molar tooth, end of its fellow being seen on the other side.

In cases where enough of the front teeth are lost to afford room for food to enter, the jaws need not be opened more than will just give room for the rubber to pass through to hold the parts of the splint outside the teeth to the parts inside. A separation of a line would be sufficient, or *even less*, if any back teeth were absent to give room for pillars of the rubber to hold the upper splint to the lower.

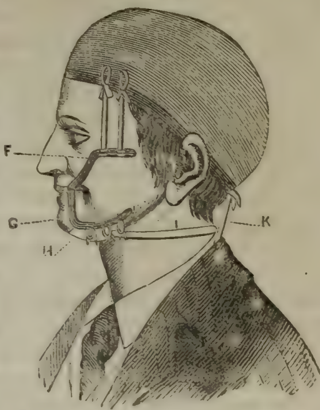
As a rule, the splint should be fastened on both sides, above and below. Fractures back of the teeth are frequently less troublesome, so far as application of the splint is concerned, than those which are broken in the body.

When the body is fractured behind the canine, the back fragment requires no support to keep it in the splint, the muscles doing that effectually. But that portion of the jaw which includes the symphysis, whether separated on one or both sides from the parts behind, must be *firmly held* up in the splint by one or two screws, according as it is fractured. When the fracture is between the lower canines, one firm upper central incisor will hold the splint up firmly. With fractures in the *back* of the lower jaw, a tooth on each side of the upper jaw, back of the canines, would be sufficient for any case. Teeth which have lost much of their supporting alveolus will *bear great strain* in the *direction of their sockets*, but the firmest teeth will suffer from slight lateral pressure; consequently ligatures are of little use, except temporarily. The thread must be removed from the screws on the ends which enter the teeth. The holes drilled to receive them should be from half a line to a line in depth, according to the size of the tooth. This will not injure the teeth, but they should be filled, however, after the jaw has united.

This splint can be made very thin, a shelly covering being all that is necessary in many parts. Openings should be cut in the sides where the absence of teeth or separation of the jaws gives a chance for the saliva from the parotid glands to enter the mouth, otherwise it may overflow at the lips. Small openings should be made opposite particular teeth, to observe how the jaw stands in the splint. This is important in all splints.

Fig. 3 shows the wings for cases having no teeth in either jaw—the ends of the wings within the mouth being imbedded in a vulcanite splint similar in principle to that of Fig. 2.

Fig. 3.



F, upper wing. G, lower wing. H, mental band to hold the jaw up in the splint. I, neck strap to keep the band back. K, balance strap to hold the cap in place.

Wings made of steel may be quite light. They should have fine teeth along the edges where the band and tapes bear to prevent slipping, and small holes every half inch to hold the strings, lacing, etc. The arch of the wings should be high enough to give the lower lip room to go well up. The wings for each side of the jaw are in one piece, and the parts within the mouth pass back in the line of the upper gum. They are thinned down and pierced with holes, that the rubber in which they are imbedded may hold them firmly.

The tape strings pass from the cap inside and under the upper wings, then up between them and the tape lacings (see figure), which keep the strings from slipping to the cap whence they started. The mental band passes up between the sides of the lower jaw and the wings where it is tied by the strings, which pass through the holes. (See figure.) The band is cut off to show this; but when worn it should be turned down on the outside and pinned just below the wings. The neck strap should be sewed to the mental band on one side and pinned on the other, and worn tight enough to keep the band from slipping forward over the chin.

The jaw and splint are supported by the cap forward of its centre. This is counterbalanced by the elastic strap which passes from the back of the cap down around an unelastic and much heavier strap, extending across and fastened to the shoulders by elastic ends. The balance strap returns to the cap and is buckled tight enough to hold the jaw up. At night it may be slackened to do this, with the neck flexed. It slides on the shoulder strap as the head inclines to either side.

By this arrangement the splint is a resting place for the broken jaw, while the wings give firm attachment to appliances which hold the jaw up with the least possible pressure upon the external parts, as the wings need not press either against the jaw or the zygomas.

Should the band fail to keep a very depressed fragment in place, a metal loop may be fastened to the wings. From this, a metal point going through the soft parts could be brought to bear on any portion of the bone requiring firm support. (See Malgaigne.) But no external appliances, especially those which rest upon the muscles, can give the firm and comfortable support afforded by splints fastened to the teeth. Therefore, with suitable teeth in either jaw, the cap, or the mental band and corresponding wings, should be dispensed with.

When getting the articulation, or relative position of the jaws and teeth, it is necessary to bear in mind that the *position* of the lower jaw is *peculiarly* dependent upon the muscles attached to it. Neglect of this

has caused great mistakes both in diagnosis and treatment, patients having been put to much suffering by the endeavors of surgeons to set fractures which did not exist, the displacements supposed to indicate them being the result of fracture in another part of the jaw—the latter being drawn out of shape by the muscles, etc. (suffering from laceration, contusion or severe swelling), and *thereby prevented from going into proper articulation with the upper jaw*, while the surgeon supposes that the ramus, or neck of the condyle, etc. is broken.

With only incomplete fracture, in which the bone retains its shape so perfectly that treatment is unnecessary, weeks or even months may elapse before the muscles are able to bring the jaw into place, so that the lower teeth will close against the upper, as before the injury. In fact, this inability may be present *without any* fracture of the bone.

These injuries are frequently aggravated by bandages, and the displacements increased and caused by them in the broken jaw, and also in its relation to the upper, are sometimes irremediable by any subsequent efforts, even in cases which correct treatment in the outset would have cured perfectly.

In consideration of these facts, it is important to discriminate between displacements which can be reduced by art and those which should be left to nature.

The fragments of the lower jaw having been set in their proper places relatively to each other, the whole must be put in normal relation to the upper jaw, *as near as the condition of the muscles and ligaments admit.*

If the jaw is allowed to move during treatment, it will generally go into place before the bone is firmly united. When held still, it may not do so until some time after.

(Remarks upon displacement are given only so far as they are directly necessary to a proper application of the splints, and to an appreciation of their efficacy—the object of this paper. Correct diagnosis, however, is the foundation of proper treatment, and will be dwelt upon hereafter.)

Fig. 1 is the representative splint for the treatment of cases in the first class, or those in which the jaw is left free. Fig. 2 for the second class, or those in which the jaw is held still.

The articulation in each class is obtained by a method differing from the other. Consideration of these methods has been postponed until now, that they may be more easily understood. The reason for getting the articulation in different ways will be seen distinctly by recollecting that the fractures in the first class can be so *well* held together that the gutta-percha and wax have a firm resting place to carry them against the upper teeth. In the second class, however, it is frequently difficult, and occasionally impossible, to set the fragments in place, although it is desirable that *the splint* should hold them precisely so as regards each other, and, as a whole, in the best possible position relatively to the upper jaw. Now, the upper jaw, being uninjured, affords a proper basis for the gutta-percha and wax. The lower jaw can, therefore, be pressed *carefully* up in place, and any fragment *specially* directed into the best attainable position in the wax. The wax, with its support of gutta-percha, may then be put upon the cast of the upper jaw, and the adjusted cast of the lower jaw placed in it precisely where required, as there is now a second opportunity to overcome any imperfection in the bite made by the teeth in the displaced fragments.

In the first class, a piece of dentist's gutta-percha should be warmed by *water*, and moulded to the plaster-cast of the lower teeth, etc. Upon this sufficient wax should be placed to give a bearing for the upper teeth and the proper thickness to the splint. When cold it must be placed on the *lower teeth*, and the jaws closed until the upper teeth press properly into the wax, then replaced upon the cast and trimmed into the shape required for the splint. The indentations made by the upper teeth should be cut down, so that only their points may touch the splint. The whole should then be set in a vulcanizing flask, to form the mould for the rubber splint.

But in the second class, as indicated before, the gutta-percha, etc. should be placed upon the *upper teeth* or *gum*, and the lower teeth or gum brought up in place. A case, however, is sometimes seen in which the articulation must be obtained in a radically different way.

When the upper teeth are so marked by the lower ones as to indicate the relative position of the fragments clearly, they do this for the jaws also; and by placing the adjusted cast against the upper cast, and setting them in an articulator, the normal relative position of the jaws, whether open or shut, may be obtained more accurately than from the mouth, *in some fractures*. A model of the splint can therefore be made of gutta-percha. When quite cold from immersion in ice water, it should be put upon the upper jaw, and the fragments of the lower pressed up into it, to test the accuracy of the adjustments. This model might be used to form the mould for the splint without the original cast, if it were found that either were incorrect, for the gutta-percha could be made to fit by a little heat and pressure. As a rule, it should only be used to set the casts.

This plan is less painful to the patient in extreme cases, as it avoids the setting of the fragments and taking the bite. But it requires considerable care, as allowance must be made for any altered condition of the fractured surfaces, and also for any inability of the fractured jaw to go into proper articulation with the upper.

The gutta-percha or wax, when taken from the mouth, should be placed between the cast representing the lower or broken jaw and that of the upper jaw, then cut into shape, the female screws, or the wings, imbedded, and the whole set in a suitable flask.

The nuts for the screws should be about an eighth of an inch square, and a little less than a line thick, thus giving sufficient length to the female screws in the centre. The nuts should be beveled down, inside and out, on three sides, but the fourth only down to the middle one of three gold strips, of which the nuts are formed. This strip, being left long, should be turned over a short distance from the nut and its edges notched—it will then act as a standard to hold the nut in place in the mould. Each nut must also have a piece of tough wood screwed into it. To set them in position, bore a hole in the plaster tooth exactly where the screws are to enter the natural teeth. Place one end of the wood into the hole with the *nut* against the plaster tooth, and bring the wax up close around it. In this way the other end of the wood will stand out and be imbedded with the gold strip in the plaster forming the mould, and the nuts held firmly while the rubber is packed.

Dental works give full directions for the vulcanization of rubber, and also as to many things necessary to a successful application of these splints.

Before applying the splints, all the projections caused by air holes, or other imperfections in the plaster-cast, must be cut away, especially in the parts covering the teeth. The rubber may also be beveled off where it fits close on the festooned edges of the gum. This will give more room for the teeth to enter in applying the splint, and leave the gum unpressed while the splint is worn. The latter should be well oiled inside before application.

A piece of packthread or silk, about a foot long, placed around the neck of one or more teeth, is frequently useful to draw a fragment into the position suitable for entering the splint. It should be tied at the ends, but not around the teeth, so that it may be easily cut and drawn away before the splint is on tight. Although the fragments of the bone may not have gone completely into place before taking the impression, little anxiety need be felt as to their going up into the splint if the latter has been properly adjusted, as the muscular displacement frequently yields to the more normal condition produced by the splint, even when it is only partially in place.

If the jaw should not go well up in the splint, it may be worn loose for a day or two, to allow the muscles to relax. This, however, is rarely necessary.

A tube, just large enough to slide into the female screws, should be inserted, to protect them while the teeth are being drilled to receive the ends of the screws. The tube must be made of thin plate, and should be set at a right angle in the end of a thick piece of plate, that the latter may serve as a handle to keep the tube from turning with the drill.

Rubber splints are neat and comfortable. They can be kept free from food and all unpleasant odors, if frequently cleaned externally with a tooth-brush, and on the inside by means of a small sponge on the end of a crooked probe. They should also be frequently syringed with warm water, etc.

(To be continued.)

TRANSACTIONS OF THE BROOKLYN DENTAL ASSOCIATION.

BY W. C. HORNE, NEW YORK.

January 9.

The Association met at Dr. Perine's, the President, Dr. W. C. Parks, in the chair. There was an attendance of twenty-five members.

The subject of the evening, "Dental Medicines," was introduced by remarks from Dr. Horne. He said that this was a subject of very great interest to every dentist whose thoughts or aims extended beyond the mere filling of a simple cavity, or the setting of artificial teeth, without any thought of pathological conditions. No want was more keenly felt by the dental student than that of a text-book on dental therapeutical agents. The practice of those few operators who give their attention to treating the various forms of disease presented about the dental organs

is varied, and to a great extent still experimental; while the portions of their experience which reaches the profession is only fragmentary.

Very great uncertainty exists as to the effects produced upon the dental pulp by many agents, some of them the commonest; the same doubt is felt as regards the dentine; the process of dental decay is still wrapped in mystery; and alveolar abscess too often proves a slough of despond. That much contradiction as to means and methods exists, is known to every one familiar with our current literature.

We claim for dentistry that it shall rank as a distinct branch of medical science; but to make good this claim, its practitioners must be the possessors of anatomical and physiological acquirements, a good degree of intelligence, the habit of close observation, and a talent for diagnosis; indications of a clear head, which should guide a steady hand. We have lived to see dentistry recognized as a profession, thanks to the labors of indefatigable and industrious men in its ranks. While the mechanical skill of its practitioners at home is unrivaled, a brilliant record has been made by the scientific researches of the members of the profession in the mother country, now being succeeded in this by enthusiastic followers in the lead which those investigations has opened up.

The department of dental medicine is yet undeveloped; whatever attainments may have been reached by the few, the many are still in the dark as to the application of remedial agents; while no one has yet had the boldness to lay down a system of treatment which shall be preventive of dental maladies.

It is not in my power to do more than indicate some of the most prominent agents generally found in use in the dental office. Among these are the escharotics, the essential character of which is, that they destroy the vitality of living tissue; some of them afterward acting as antiseptics. Among these are creosote, arsenic, chloride of zinc, the bi-chloride of mercury, and the sulphates of copper and zinc. Others not only destroy the vitality of the living tissue, but also dissolve it, whether dead or living, as chromic acid, caustic potash, nitrate of silver. Caustic potash acts by the dissolution of the albuminous and fibrinous substances with which it comes in contact; while with chromic acid the tissue is oxidized by the facility with which the acid parts with its abundant oxygen when in contact with organic bodies. These agents are useful in obtunding the sensibility of dentine, devitalization of the dental pulp, and for breaking down fungoid growths of the soft tissues.

"Astringents are such substances as, applied to the body, produce contraction and condensation of the soft solids, and thereby increase their density and cohesion." Their local effect is particularly shown when applied to the mucous membrane of the mouth. They nearly all possess the power of coagulating or precipitating albumen. They are vegetable and mineral. Of the former series are tannin, catechu, nut-galls; of the

latter, alum, acetate of lead, sulphates of iron and zinc. They are useful in inflammatory conditions of the mucous membrane of the mouth.

Styptics are of special importance in those cases of alarming hæmorrhage which sometimes occur after extraction of teeth, due mainly to a deficiency of fibrin in the blood. The persulphate of iron is most to be relied upon in such an extremity—the application to be made not only in the socket, but also upon the bleeding surfaces of the gums, where it is to be retained by pressure. To be effective as a styptic, an agent must form an insoluble compound with some constituent of the blood. It does not at all follow that an escharotic shall prove to be a good styptic; nitrate of silver forms a firm clot, but is soon dissolved by the albumen of the blood; and the same result is seen after the use of many mineral astringents. In ordinary cases, tannic acid is an excellent styptic, not being soluble in any constituent of the blood.

In alveolar abscess, iodide of potassium is in general and approved use as an alterative and restorative. And where it is desirable to give tonicity to the system, nitro-muriatic acid will be found a valuable assistant.

A good deal of speculation has been indulged in as to the use of the phosphates in dental hygiene. The obstacle to their successful introduction into the system is their great insolubility. Thus, it is believed they pass unchanged through the alimentary canal, and without diminution in quantity. Preparations of the phosphate of lime, contained in a pulpy magma, without excess of acid, favorable to absorption and assimilation, were introduced some years since; but no reliable data are available as to their general utility.

The narcotic series have been always specially interesting to dentists; and to the dental profession was due the discovery and introduction of the anæsthetic properties of nitrous oxide and ether. The discoverer of local anæsthesia by ether spray was our distinguished English colaborer, Dr. Richardson. The attention of the Society had been so fully directed to this class of agents lately, that he would only name them, with the remark that local anæsthesia was growing in favor with the profession for a variety of operations. Not intending to do more than direct attention to the articles cited, he would leave the subject for general consideration.

Dr. J. S. Latimer said he found old muslin a much better absorbent of moisture than cotton; it was therefore superior for applying medicines.

Dr. Varney stated that, in the Southern army, when lint was exhausted, cotton baked in an oven was substituted, and found to answer better.

Dr. Scott applied tannic acid dissolved in glycerin for arresting hæmorrhage.

Drs. W. H. Allen, Abbott, and Varney occasionally allowed patients to inhale chloroform during the excavation of very sensitive teeth.

Dr. Atkinson being called upon, said it was no easy matter to understand the phenomena by which the different impressions of pain and pleasure are communicated; especially is our knowledge limited of vital chemistry. Liebig's theory supposed the nitrogenous substances to be necessary for the production of brain and muscle, but in practice this was entirely at fault. The soldier or sportsman prefers hydro-carbons, as sugar and fat, for his rations, while the Esquimaux takes his in the form of blubber. Nitrogen, the essential constituent of the urea, originally comes from the atmosphere. This is suggested as the only rational source by the nitrogenous portions of the body not being wasted in persons not provided with the like food. Medication is only a kind of nutrition—a purgation of the tissues; all nutrient action occurs in cells, and in the interspaces between the cells—in the germinal matter, the mucous mass, the neural sea. Foods and medicines are only appropriated in consequence of the affinities subsisting between them, or some of their constituents, and the wasted or sickened tissues to which they are brought. We know so little of that which constitutes molecular action, that it requires deep research, and continued observation, faithfully executed, to learn how to feed or medicate the tissues. The action of remedies is specific only because of specific need in the territories inviting their action. In the elucidation of these principles, we might run the whole round of detail of conditions calling for the administration of all our polychrest or pet remedies, as well as those of rarer resort. Hence, to be instructed in any case, present that case to the first dentist you meet, requesting him to favor you with his best views upon it. If each will take this course, a few years will suffice to correlate and establish a correct understanding and proper administration of dental medicines among us.

Dr. Fitch said he was aware that much ignorance existed among both physicians and dentists as to the action of medicinal agents, and expected it would continue to be so in the future. If the natural processes of vital action were carried on under the eye, or were demonstrable, we might safely make deductions as to the effects which different agents would bring about in the system; but it was to be borne in mind that chemical actions, which out of the body were uniform, must be greatly changed or modified when subjected to the vital forces. Vital chemistry is hidden chemistry; and every physiologist has his own theory of the process of nutrition. It was well to be posted on facts, but not worth while to rack our brains over theories, when the facts were changed by the modifying conditions of each case.

January 23.

The Association met at Dr. Horne's, the Vice-President, Dr. A. C. Hawes, in the chair.

The Association directed the purchase, from Messrs. Wales and Morrison, of a microscope with a one-fifth, four-tenths, and one and a half inch objectives.

Drs. J. G. Ambler and C. F. Ives were elected active members.

Dr. F. Abbott presented a watch-spring saw, set in a small frame, at an angle of ninety degrees, for cutting away the superfluous gold of approximal fillings, in positions difficult of access to the file.

Dr. Mills reported having experimented with Lamm's gold, which he recommended very highly for packing quickly and presenting a dense surface. It possessed a quality of retaining its adhesiveness under moisture, which no other preparation that had come under his notice ever had. He was not at all favorable to submarine fillings, but felt that this article, which Dr. Arrington had lately introduced to the profession, had great merits, and was fully equal to the representations made by that gentleman.

Dr. Burgh introduced the subject of the evening, "Regulating Teeth." After referring to numerous processes generally in use, he proceeded to explain a method which he had recently adopted, and which was mainly original with himself. For the sake of more perfect description, the plaster casts of the upper and under teeth were exhibited in their original positions, and also one of the upper teeth after some improvement had been gained. The cast of the superior maxillary, as it originally was, presented a very contracted arch and irregular set of teeth. Not only were the teeth crowded, but the two central and the right lateral incisor needed to be turned in their sockets. It would have been a great task to regulate this case with the ordinary method of ligatures, even if some of the teeth were extracted; to accomplish it without, would be almost impossible, especially when the age and habits of the patient are taken into consideration, who is 23 years of age, and has to attend to his daily business. The object was not only to regulate these teeth, but to expand the roof of the mouth and increase the size of the arch, and without extracting any teeth. The method employed is as follows:

A cast is obtained from a wax impression. The teeth, and the surfaces of the roof of the mouth to be acted upon are cut or scraped away to an extent equal to the amount of space which it is prudent to move the teeth at one time. The plate is then inserted in the mouth; the patient is directed to exert force upon it with the lower teeth, which forces it up into the roof of the mouth—expanding the arch in whatever direction the force is applied. In this case every tooth was operated upon at the same time—some more, and others less—and also the roof of the mouth in every direction except upward. As soon as the teeth have

yielded, the plate will begin to operate in the roof of the mouth. It will operate here more slowly, as the force has to reach the maxillary bones through the yielding gum. The gums will sometimes become inflamed, but if the cast has not been cut too much, this will pass away as the bones expand. Care should be taken to have the plate antagonize with the lower teeth, so as to produce a uniform and steady pressure. It is not well to cut the cast much, in order to get more work out of each plate, for the plate will not work as well as though the cast were cut moderately. He generally cut his casts the thirty-second or the sixteenth part of an inch.

As soon as one plate has done its work, a new impression should be taken, and the process repeated. The length of time necessary for one plate to be worn varies from a few days to two weeks, according to the amount of work required of it. If it is but to move a few teeth, it will settle up in a few hours; but if the roof of the mouth is to be spread much, each plate may have to be worn for weeks. The length of time which each plate was worn in the present case was about two weeks, the number of plates already worn being twenty-eight. The case will require three or six months yet to complete it. When it is finished, the lower teeth will be commenced with. After the arch had been expanded considerably, he commenced to turn the three incisors. This is done on the same principle as that on which the arch is expanded, viz., by cutting away the plaster teeth in such a way as that a rubber plate made to the cast will produce a twisting pressure on the natural teeth. The same kind of plate is used for this as for the former, but with the difference that the plate runs over the cutting edges of the teeth to be acted upon, and on to whatever portion of their labial surface is to receive a pressure. Before making the plate, an amount of plaster is moulded on to that surface of the tooth which is opposite to that which has been cut, to leave room in the plate for the tooth to move.

This method of regulating teeth Dr. Burgh believed to be the most effective, simple, and convenient—for both parties interested. If the operator have an assistant in the laboratory, all the time that he need personally devote to it is, to take a wax impression, and cut the casts for the plates. A plaster impression is perhaps better; and where the case is a simple one, a wax form can be kept which will take a plaster impression just as easily as a wax one—as, in such cases, it is often not necessary to include any but the palatal surfaces of the teeth.

Such a plate will operate with certainty in the mouth of the most awkward patient. All he has to do is to insert it in the mouth, close the teeth upon it, and the work is commenced. Neither can anything be imagined more convenient for him; he takes it out to eat, can dispense with it on any occasion when it is desirable to do so, and has the most perfect control over it. If one plate is lost, or gets broken,

he can fall back on the last one, if the teeth should recede before he can see his dentist; and if the patient were taken sick, so as to prevent him from wearing a plate so long that his mouth should return to its original condition—which is not now possible—the whole series of twenty-eight plates would do their work again. If such a disaster should happen to the case while being regulated by ligatures, the dentist and patient would be somewhat discouraged.

This method of regulating teeth is now beyond the doubt of experiment, although perhaps published for the first time; and while the case presented is still incomplete, it has had an amount of labor expended upon it equal to what has been necessary for half a dozen cases which have been commenced and completed since.

With regard to the practice of extracting in regulating, there are two conditions which he thought would justify the operator in that procedure. One is, when the teeth cannot be regulated without increasing the arch so much as to make them protrude unnaturally. Another is, when the arch cannot be increased without destroying the articulation with the lower teeth.

The arch of a set of teeth is but the segment of a circle; the segment necessary to complete the circle is a curved imaginary line running from the last molar on one side to the same on the other. If a set of teeth are irregularly crowded into a smaller circle than the type which nature intended for it, the only way to conform to nature is, to increase the whole circle. As we can increase but the segment occupied by the teeth, it may sometimes be the least of evils to extract such teeth as may be necessary to keep the arch within proper bounds—that is to say, so that it shall be no larger, or not much, than it would have been if the whole circle had been enlarged, and all the teeth retained.

While he was not in favor of the extraction of teeth, yet there was one thing which he had learned—that there is no rule without an exception. He would therefore also favor extracting where not to do so would break up the articulation with the opposing teeth. In all our operations on the dental organs, we cannot forget their relations to other parts. An absolute perfection in the position of an upper set of teeth, may be an imperfection in their relations with the lower ones. Let us suppose a crowded condition of the upper set of teeth, such as presented, with a lower denture of which the six-year old molars have been extracted, and the arch regular, though somewhat contracted. Would it not be better to extract a bicuspid on each side, and thus preserve the relative position of the teeth with the lower ones? He thought it would. Otherwise, in the first place, the teeth would protrude beyond the lower ones. In the second place, mastication would be impaired; and, in the inevitable breaking up of the occlusion of some teeth, there is danger that they may, in course of time, be raised from their sockets.

The standard of perfection in all things is relative, and not absolute. In physics, as in morals and in thought, the mutable relations of things control conditions. He who realizes this will look beyond the conclusions of theories and of schools, and will regulate teeth according to the circumstances of each case.

Dr. Atkinson was glad that the preceding speaker had demonstrated that there was more than one way of regulating teeth. Nature was always simple in her methods; and the plan propounded was commended to his judgment by its simpleness and efficiency. The first necessity always was to get control of the case. As all the solids of the body are continually changing, the unnatural occlusion can of course be broken up and teeth brought into correct position, and there retained, by artificial means, until fastened by calcific action in their new positions. He was a great stickler for commencing to regulate teeth at as early an age as circumstances will permit. A piece of hard hickory or ivory in a mother's or nurse's hands will do more in a few weeks than months of labor subsequently bestowed. It should not be forgotten that the dental ligament surrounding the tooth at its neck must not be disturbed, for if once sloughed off, it is never reproduced. This, he said, was the great evil of ligatures, if carried beyond the line of the enamel. It was sometimes asked, Why should not the long-continued movement of teeth in regulating be as injurious as slowly wedging them apart? The difference lay in the direction of the movement. He had seen cases where death of the pulp was produced by very slight lateral pressure. Pressing from the curve does no mischief, but if exerted in the line of the arch, it might choke off the nerves and vessels entering the apicial foramen.

Dr. Bogue suggested as a prevention of change of position in the posterior teeth, where the mouth must be kept open for regulating the anterior ones, that gutta-percha be worn on the teeth which then failed to articulate. He credited Dr. Flagg with the idea. Some years ago a lady aged twenty-five or twenty-six years was put into his hands for treatment, whose upper teeth projected to such an extent that closure of the lips was nearly impossible. The general position of the teeth, aside from the spaces produced by this projection, was normal. In this case he made a gold plate covering the roof of the mouth, attached to the molars; from the clasp, between the first molar and bicuspid, a thick bar ran outward three-sixteenths of an inch. A piece of clasp metal was bent to fit around the circle of the upper teeth, reaching from the space between the bicuspids on the one side to the same point on the other; the two ends of this band were bent outward at right angles with itself; in front, opposite the incisors, some small strips were soldered and bent into hooks over the cutting edges of the incisors, to prevent the band from slipping up against the gums. Holes being now drilled through the two outward bent ends of the band, and also through the two pro-

jecting studs in front of the molars, and screw threads being cut in the latter, it only remained to insert screws in their proper places to complete the apparatus. A few turns of the screws each day sufficed in a few weeks to draw the teeth inward to such an extent, that from a picture sent him some time afterward he should not have known of the previous deformity.

The subject appointed for discussion at the next meeting is, "The General Treatment of Children's Teeth."

February 6.

The Association met at Dr. Bogue's, President Parks in the chair.

The object-glasses for the microscope of the Association were tested, and afforded much profitable entertainment to the members.

Dr. C. P. Fitch presented a communication from Dr. J. Taft, asking the assent of the Association to a change of the time of meeting of the American Dental Association, from July to May of the present year. A motion to leave the matter to the judgment of the President and Executive Committee of that body was lost, and it was unanimously resolved,

"That the Brooklyn Dental Association object to any change in the time of meeting of the American Dental Association." Dr. J. G. Ambler gave a resumé of the late proceedings of the American Dental Protective Society. In conjunction with a similar society having for its field the Western States, and with the support of the profession within this circuit pledged, a powerful opposition was insured to the illegal claims of the Boston Dental Vulcanite Company.

The Association then adjourned to the usual time, the next subject to be,—The Treatment of Children's Teeth.

REPORT OF DISCUSSIONS OF THE SOCIETY OF DENTAL SURGEONS OF THE CITY OF NEW YORK.

BY J. S. LATIMER, D.D.S., NEW YORK.

On the evening of July 18th, R. Varney, M.D., read a paper, in which he treated "Epulis," the subject of the evening, in a straightforward and practical manner.*

Geo. A. Mills stated that he had a case of epulis lately, which he was succeeding well with, when treatment was interrupted.

W. H. Atkinson, M.D., defined epulis as a tumor upon the gum. In bony epulis, the periosteum is not the bone-maker. He administers muriated tincture of iron two or three days before operating in such cases, to prevent hæmorrhage. Would give teaspoonful doses three or four times daily. The same treatment is excellent in hæmorrhagic diathesis.

* I have tried in vain to procure this paper for publication.—J. S. L.

Would apply chromic acid as an escharotic, and afterward dress with glycerin and tannin.

The patient should be seen twice a day, until the eschar comes away. In the diagnosis, if the line of demarkation is distinct, the indication is that the tumor is benign.

A. L. Northrop mentioned a case in his practice in which, although he had removed the tumor several times, it had presently returned to disappoint him.

On the evening of September 12th, Dr. Atkinson read a paper on "Dentistry."

J. S. Latimer read a paper on the subject of the evening, "Contour and Flat Fillings."

Dr. Atkinson knows contour plugs are superior to the flat. Dr. Wm. H. Dwinelle has the merit of publishing the first consecutive monograph on contour plugs. The criticism of our pupils will benefit us, if we heed and are humble. We must dig deep down into anatomy, chemistry, etc. If we wish to learn, we had better go to some one who can perform operations better than we, and take a few lessons. If any of the members insert flat fillings, he hoped they would learn to do better.

F. H. Clark inquired whether young practitioners could not do more good by the old method, than by attempting to restore the contour of the teeth they fill.

Dr. Atkinson replied they could not. It is as easy to learn how to do the work right, as to learn to do it wrong.

F. H. Clark believed that the poor could not afford to pay for contour fillings, which, on account of requiring a large amount of material and labor, were necessarily expensive. He deemed it better to furnish them flat fillings than to insert an inferior material, or to permit the teeth to go unfilled.

J. S. Latimer defended the price, believing a contour gold filling preferable and cheaper at $10 than a flat one at $2, for the reasons assigned in his paper.

I. W. Lyon favored educating the people so that they will appreciate good work, and know that good work is cheaper at a larger price than inferior operations at a much lower fee. Contour fillings, if rightly made, are not dear at the prices usually charged for them, but are really cheaper than the flat fillings at the lowest price.

Dr. Burras had practiced making flat fillings a great many years, and thought well of them.

F. H. Clark thought a tooth was less liable to subsequent decay when freely filed, than when a narrow space was left between the teeth, by restoring the contour with gold. He had known contour fillings to be displaced while eating.

C. P. Fitch, M.D., invariably anchors his gold in the "base" of the cavity, and builds from that. He restores contour and protects the walls. Counsels with the patient about the price. The mallet has changed his method of operating. If he had to go back to hand force, he would abandon dentistry. If the patient was unable to pay, would not restore to the same extent, though he would protect the walls thoroughly.

W. B. Hurd thought it better not to take extreme views, but would decide, when he should see the case, how he would fill. Contour fillings look well; he puts them in, but he does not deem them essential to the preservation of the teeth.

B. W. Franklin was encouraged to try to do better work. He was surprised to hear gentlemen condemn contour fillings. We should learn from nature. He could say for himself that, when cases came to him which were too difficult for him, he recommended the patient to some gentleman whom he believed capable to perform the operation well.

At a meeting held September 26th, B. W. Franklin read a paper on "Sensitive Dentine," the subject of the evening.

W. C. Horne, the regular essayist, followed on the same subject.

C. E. Francis was not yet prepared to agree with the announcement in the first paper, that sensitiveness of the dentine is always pathological. He believed sensation is conveyed by liquor sanguinis in the tubuli; in extreme cases, employs arsenious acid with tannin, but generally applies creosote, or creosote and tannin, and seals temporarily.

J. S. Latimer had recently met with a somewhat difficult case. All of the teeth were much abraded, and required elongating with gold, as in two of the teeth the pulps were dying, and it was quite possible that all would die. The performance of such operations on teeth having living pulps is always difficult; but when, as in this case, the dentine is very sensitive, and the patient unwilling to bear pain, our troubles are increased. Unable to apply creosote or any of the milder agents, he built down the two superior canines, which seemed less sensitive than the other teeth, thus breaking up the occlusion, and then applied small particles of nearly dry arsenical paste, directly upon the points he wished to drill for anchorages. A mixture of resin and wax was then heated to the melting point, and permitted to flow over that surface of the tooth. The patient was instructed to keep his "quid" away from that vicinity for about six hours, after which the paste was to be removed. By this means he was enabled to drill retaining points on the smooth grinding surfaces.

B. W. Franklin believed sensibility of dentine is always the effect of acid, and hence abnormal. To his mind, there was no reason in the theory of pneumatic pressure on the pulp by compression of the tubuli. He would treat with alkali. Temporary fillings generally give relief, by

preventing contact with acid. He called on gentlemen to state their theories.

W. C. Horne has employed arsenic but very little. It is too dangerous an agent for general use. He finds that temporary stoppings generally bring the desired immunity from pain.

I. W. Lyon has sometimes succeeded in allaying sensibility during the excavation by raising the temperature of the teeth considerably, by means of hot water gradually applied.

C. P. Fitch, M.D., admitted the acid theory, and claimed that the acid diathesis is caused by perverted nutrition. The emunctories, in such subjects, are unable to properly perform their functions. The effete matter thus left in the system may be oxidized by the administration of the mineral acids, among the best of which, for this purpose, is the nitro-muriatic, three or four drops daily. Its tendency is to increase the plasticity of the blood, and thus change the diathesis. He does not believe in the existence of nerve fibrillæ in the tubuli, but would rather impute the conduction of sensation to magnetic force excited by the acid. All sensibility of dentine is due to abnormal conditions.

At a meeting held October 11th—subject, "Anæsthetics in Dentistry."—J. S. Latimer read a short paper, in which he said we divide anæsthesia into general and local, the former being induced by the action of agents upon the nerve centres, by which those centres are rendered insensible to impressions made upon the peripheries of nerves; while the latter is induced by the temporary inability to convey impressions on the part of the injured nerves.

Of the agents employed for the production of anæsthesia for dental operations, nitrous oxide and the spray of ether and rhigolene are now attracting most attention. Probably Dr. Richardson's method acts by stopping the vascular and neural circulation of the part. Freezing the gum for the painless removal of teeth is not a new idea, as more than ten years ago a freezing mixture was employed for the same purpose; but the greater facility with which the temperature is reduced by the spray, makes Dr. Richardson's method particularly valuable.

The principal drawbacks to the general application of the spray seem to be the accumulated saliva, which prevents its use on most of the inferior teeth, and the tendency of the pipes to become clogged with ice. Moreover, the pain caused by the application of the spray is sometimes quite severe, inclining the patient to submit to the operation without the spray. Even in general surgery, I fear the pain caused by the rapid change of temperature will often be in the way of its employment. These notions are offered as the surmises only of one whose experience with the method has been quite limited.

I have been especially pleased with Dr. Goodwillie's apparatus for ad-

ministering chloroform, ether, and nitrous oxide. For chloroform and ether, it has the virtue of being economical, for not a particle of the vapor is wasted, while the operator is enabled to perfectly control the proportions of air and vapor.

In the exhibition of the gas, its arrangement permits the patient to exhale the respired gases and vapors with effete matter into the atmosphere. Thus, he is enabled to administer pure nitrous oxide, for which he claims the following advantages:

1st. Less acceleration of the pulse.

2d. Less tendency to cerebral and pulmonary congestion.

3d. Less danger of headache and nausea, when two or more doses are administered at one sitting.

My friend, O. A. Jarvis, of West Thirteenth Street, has invented an inhaler for the administration of gas, which is provided with valves for permitting the exhalations to pass into the atmosphere, with the operation of which I have been a witness in one case.

In that case the breathing was good; the color of the face only very slightly flushed; the anæsthesia complete and readily attained, and the subsequent effects not at all unpleasant, though the subject was by no means a good one. From considerable examination and inquiries, I am pretty well satisfied that the method of exhibition at first in vogue must give place to the better one of connecting the inhaler directly with the receiver.

H. R. White, by invitation, made some remarks. He has employed the spray for inducing anæsthesia for the removal of dental pulps; likes Goodwillie's inhaler; had kept a child under the influence of gas for thirty-two minutes, without bad effects. Anæsthetics induce convexity of the red blood-disks; and, in the case of chloroform and ether, the concavity does not return; hence, as such disks must die, death of the entire blood is liable to supervene. He liked the Jarvis nose-inhaler.

A gentleman lately from London reported, that in the London hospitals, where Dr. Richardson's method was in use, it was successful in only about half the cases.

Mr. G. Q. Colton being present, he was invited to make some remarks. He admitted the excellence of the Goodwillie apparatus, but deemed the carbonic acid of the respiration rather a help to the induction of anæsthesia than otherwise. The small proportion of carbonic acid could produce no injury so long as an excess of oxygen was present in the inhaling-bag. He promised that he would give the method of administering from the receiver a fair trial, and, if he should find it preferable, would adopt it altogether. He had been informed that Flagg & Osgood, of Boston, after trying the new method of inhaling, during a number of months, had finally returned to the rubber-bag and the primitive inhaler.

O. A. Jarvis has no difficulty with the nose-piece. Stertor and the purple appearance of the features are abnormal, and signs of danger.

The same subject being continued on October 24th, B. W. Franklin, chairman of a committee appointed to investigate and report upon the merits of Dr. Richardson's apparatus, said he had been experimenting with the spray. The ether he had employed did not work well, from some cause, but the rhigolene had answered well. He had subjected his own teeth and gums to the action of the spray, and had frozen his hand so that he was enabled to pass an instrument through the flesh without pain. He had also succeeded in removing five teeth for a patient, with the aid of the spray, greatly to his and the patient's satisfaction. He hopes much good of the spray.

On a test motion, the Society refused to commend nitrous oxide as the best general anæsthetic for dental purposes, but the following motion prevailed:

Resolved, That this Society deprecate as uncleanly and injurious the method of administering nitrous oxide still largely employed, whereby the patient is compelled to rebreathe his own exhalations.

A committee of three, appointed to test specimens of Thillon's foil, sent to the Society for that purpose by Mr. Thillon's agent, reported that, though some of the foil was very excellent, the major part of the gold was hard and intractable, without being very adhesive; hence, they were compelled to report it as lacking uniformity.

O. A. Jarvis read a paper on "Anæsthesia," in which he commended *pure* chloroform, and claimed that impurities and ignorance are responsible for bad results. He deemed nitrous oxide, however, the best for dental purposes. He exhibited his inhalers—the one for the mouth having somewhat the appearance of a double-barreled pistol—one of the barrels connected with the receiver, and having a valve to prevent the exhalation from being returned to the receiver; the other opening into the atmosphere, and having a valve to prevent the inhalation of air. His nose-piece was formed on substantially the same principles, except that it was adapted to fit over the nose, instead of being passed into the mouth.

A. Y. Paddock exhibited a mouth-piece of his own devising, which is a modification of the one in ordinary use, and which permits the respiration to pass into the atmosphere; claimed that he had removed twenty-two teeth with one dose of gas, by the old method, without any consciousness of pain on the patient's part. He had been employing the new method for a day or two, and had been rather agreeably disappointed in it.

W. T. Shannon, D.D.S., had been experimenting with the spray; had removed five teeth painlessly, while the gums were chilled with it; had

lately used it in opening two felons without pain, either in the application of the spray or the subsequent cutting.

W. B. Hurd spoke at length against the nitrous oxide, and against those who do a wholesale slaughtering business through its aid.

T. H. Burras liked the gas, and so do his patients.

DENTAL ASSOCIATION OF CANADA WEST.

BY J. S. SCOTT, COBOURG, C. W.

A Convention of dentists was held in Toronto, January 3d, 1867.

Present—B. W. Day, M.D., of Kingston; C. S. Chittenden, of Hamilton; F. G. Callendar, of Cobourg; J. O'Donnell, of Peterboro'; H. T. Wood, of Picton; A. D. Lalonde, of Brockville; M. E. Snider, of Toronto; D. A. Bogart, of Hamilton; J. S. Scott, of Cobourg. B. W. Day, M.D., appointed Chairman, and J. S. Scott, Secretary.

The Secretary read the circular calling the meeting.

Letters were received from most of the established dentists in all sections of Canada West not in attendance, approving of the object of the Convention, and stating their inability to attend until the next meeting.

The Chairman stated that the object of the Convention was to organize a Dental Association, and to take steps to procure the passage of a law requiring dentists to pass an examination.

J. S. Scott said it was time the people had some means of knowing who were qualified to practice as dentists. He was in favor of securing an act requiring dentists to pass an examination. That the first action of this meeting should be to organize a society. He therefore moved, seconded by C. S. Chittenden:

"That we proceed to the organization of a Dental Association for Canada West."

Carried.

On motion, F. G. Callendar, C. S. Chittenden, H. T. Wood, J. O'Donnell, and the Chairman, were appointed a Committee to draft a Constitution. The Committee reported a draft of Constitution, which was adopted, requiring that candidates for membership, in addition to professional knowledge, shall have practiced successfully for five years in one place, in an established office.

The following officers were then elected:

President—B. W. Day, M.D.

First Vice-President—C. S. Chittenden.

Second Vice-President—H. T. Wood.

Treasurer—F. G. Callendar.

Recording Secretary—J. S. Scott.

Corresponding Secretary—J. O'Donnell.

Librarian—D. A. Bogart.

Committee on By-Laws—F. G. Callendar, D. A. Bogart, M. E. Snider, and A. — Lalonde.

A committee was appointed, consisting of the President, Vice-Presidents, and Secretaries, to draft a Bill of Incorporation, to be submitted to Parliament at its next session.

Several members were requested to read papers at the next meeting.

The semi-annual session will be held in Cobourg, on the first Tuesday in July next, to commence at 7 o'clock P.M. The next annual session at Hamilton, on the third Tuesday in January next, to commence at 7 o'clock P.M.

SELECTIONS.

MONOGRAPH OF THE BATS OF NORTH AMERICA. By H. ALLEN, M.D., Professor of Zoology in the auxiliary department of the University of Pennsylvania.

A monograph of 85 pages on the above subject published by the SMITHSONIAN INSTITUTE has been received from the author. The work, while giving evidence of perfect familiarity with the literature relating to the *Cheiropetra* of our country, is mainly the results of a careful and extended examination, on the part of the author, of alcoholic and dried specimens of the species in the Museum of the Smithsonian Institute, and the collections of the Philadelphia Academy of Natural Sciences, and of the Museum of Comparative Zoology of Cambridge. The comparative anatomist will find this a valuable and reliable work of reference.

The following extract relative to the dental organs is presented as a matter of interest to the student of dentistry.

TEETH OF BATS.—"*Anatomy* —From the consideration of the mechanism of the wings of bats, it is an easy transition to speak of their anatomy.

"The bones of *Cheiroptera*, though incapable of receiving air from the surrounding medium, are nevertheless of very light structure. The skeleton of a bat is expressive of lightness and tenuity. The bones of the common Brown Bat (*V. subulatus*), from which this description is taken, weighed but eleven grains. * * * * *

"The maxillary bones are stout, and support all the teeth, excepting the incisors, which are held in position by the intermaxillary bones.

"The *lower jaw* is stout, receding at symphysis, where it is very high, and extends backwards to a level with the 2d premolar tooth; coronoid process high, blunt, strongly marked externally to its base with the concave surface for the insertion of temporal muscle. The anterior border is vertical, the superior and posterior are slightly oblique, ending in the condyloid process; the articulating head of which is arranged transversely to the axis of the bone. The ramus of the jaw is turned slightly outward, and is thin and compressed. A large hamular process is conspicuous immediately inferior to the articulating surface.

"The *teeth* are of variable number—being in some species as low as 30, in others as high as 38. This variation, combined with differences in

their contour, furnish characters of great importance in the classification of these animals. The principal differences are seen in the number of the incisors and molars. The usual number of incisors is 4 in the upper, and 6 in the lower jaw. The number is never in excess of this, though frequently falling short of it. Thus, in some genera there are but 2 incisors above and four below; or there may be none above and but 2 below. When the number in the upper jaw is confined to 2 teeth the central incisors are wanting. The number in the lower jaw is always 6 in the family *Vespertilionidæ*, with the exception of the Californian genus *Antrozous*, which has here but 4 incisors. In this particular it shows evidence of its affinity with the family *Phyllostomidæ*, in which 4 incisors in the lower jaw is the normal number.

"The molars are of two kinds: the true molars, and the false or premolars. The former are the larger and situated most posteriorly, the latter are small, placed between the true molars and the canines, and appear to unite the characters of both these teeth. The premolar adjoining the first molar bears a stronger resemblance to the grinders than to the premolar adjacent to the canine, which shows decided resemblance to the eye tooth. The number of molars (true and false) in any bat never exceeds 6 above and 6 below. In any diminution of this number the first premolar is always wanting.

"The minute description of the teeth is reserved for the remarks under each species. It will be well in this place, however, to define the true molars, and since they are not subject to any material variation in shape no mention of them will be made in the text.

"The true molars are 3 in number, both above and below. In the upper jaw they are of a sub-triangular shape, wider than long, their bases being outward, and their apices rounded and blunt. The first and second teeth have two V-shaped cusps upon the articulating surface of the crown—the anterior border of each cusp being more prominent than the posterior. The union of these two cusps constitutes what is known as the W-shaped crown. This irregularity is occasioned by the sinuate incurving of the enamel of the tooth; it eminently adapts the organ for the mastication of insect food. The inner portion of the articulating face is lower than the outer, is of a rounded shape, and is furnished with but one cusp, which, however, placed immediately behind the anterior triangular cusp, runs obscurely backward to behind the posterior cusp, giving these teeth the appearance of being quadri-cuspid. The third molar, much smaller than the preceding, has a straight anterior and a rounded posterior surface; the external face of crown is irregular and sinuate, posterior unicuspid.

"In the *lower jaw* the molars are of equal size. They are longer than wide. Each tooth is made up of two V-shaped cusps, their bases lying inward, their apices very acute. The anterior cusp is wider and somewhat higher than the posterior."

"Regulating the Practice of Dentistry.—A bill to regulate the practice of dentistry has been introduced into the House of Representatives of the State of Indiana, and we are informed that a bill of like character will at an early day be introduced in the Senate. We trust this measure will receive the favorable consideration of the members of both Houses. Every intelligent person knows that thousands are made sufferers for years, or permanently disfigured, through the malpractice of

unprincipled charlatans who, through their plausible representations, often win the confidence of too credulous people. The fact is, people are unable to judge of the qualifications of the dentist, and hence are liable to be imposed upon by that class who, having spent a few weeks, or, at most, months, in some obscure office, palm themselves off by this hot-bed process upon the public as dentists. They are most frequently found to be like forced products in general, very green, always expensive, and often ruinously unhealthy.

"We should be opposed to the passage of any law that would in any way be oppressive upon any portion of the community, but the objects of this bill are so manifestly just that it must commend itself to every person who takes the trouble to look into it. There is no dentist in the State at all fit to discharge his professional obligations to his patients, but will rejoice in its passage. Indeed, the mere fact of any dentist opposing it would be sufficient cause for doubting his ability. But to the people, who are more particularly interested, can there be any doubt but that it would be an acceptable law? We think not. On the contrary, we fully believe that physicians, scarcely without an exception, and nearly every well-informed person in the State, would recommend its passage.

"The bill now before the Legislature provides that it shall be unlawful for any one to practice dentistry, except those who are graduates of some regularly incorporated dental college, those who have been ten years in reputable practice, or those holding certificates of qualification from a board of examiners appointed by the Governor. Thus it will be seen that no possible injury can result to any person fit to practice his calling, while the capable will be sustained and strengthened, and the public protected. And here the thought occurs: 'Can there be any excuse for incompetents in this profession at this day?' Certainly not. The means of acquiring a thorough knowledge of it through able instructors, and the facilities offered by several well-conducted and regularly incorporated dental colleges, *at moderate cost*, furnish abundant opportunities for honest and well-disposed persons to prepare themselves thoroughly for a faithful discharge of their duties, and it is but just that the people should be protected in the future against the machinations of all others. It may be urged by some that if a law cannot be had to regulate the practice of medicine, certainly it cannot be expected that one will be passed to regulate the practice of dentistry. But the truth is, the cases are almost entirely dissimilar. Difficulties present themselves in the former, that do not occur in the latter case. We wish a law could be passed to regulate medical practice; but who is to determine among the great variety of systems, each of which has its earnest supporters among the people, as well as the different practitioners, which class of men ought to be especially protected without interfering with the evident rights of the people? In dentistry it is quite different; one mode, or very nearly so, governs all who understand their business, and it therefore is only a question of competency. Bills similar to this before our Legislature have been introduced in the Legislatures of several other States. Indeed the movement seems to be quite general. We trust that the Committee to whom the bill has been referred will recommend its passage. J."

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BRITISH JOURNAL OF DENTAL SCIENCE.

"THE DENTAL PROFESSION IN AMERICA. By W. H. WAITE, D.D.S. —It is notorious that Englishmen at home are not generally disposed to regard with favor anything coming before them with the simple recom-

mendation that it is 'American,' and equally notorious is it fast becoming that Englishmen who have once crossed the Atlantic are ready to speak in praise of many things simply because they are 'American.' Naturally suspicious, until they have proved the merits of a case, they are as naturally warm and confiding when the proof has been afforded. Americans, on the contrary, are naturally open-hearted and free until *compelled* to be suspicious. Hence, Englishmen who visit America are startled at first by the unbounded hospitality, urbanity, and courtesy, with which they are received. If to these natural characteristic diversities are superadded the peculiarities of what in England we call 'professional dignity,' and the almost eccentricities of what in America may be styled 'free professional intercourse,' we shall be prepared to recognize very considerable differences between the state of the dental profession in England and in America.

"First of all, then, it must be remembered that *the dental profession in America occupies an independent position.* In obedience to the universal law of supply and demand, it has sprung up to meet a greatly increasing development of dental disease. Without minutely detailing its progress, the fact may be noted that a dental college was established in the City of Baltimore more than *twenty-six years ago*, having a charter empowering the conferring of diplomas. At the present time there are five dental colleges chartered by the government, and thus recognized as special institutions for the purpose of educating and qualifying men to practice as dentists. The faculty of each of these colleges is composed exclusively of gentleman practicing dentistry (except the professors of chemistry and anatomy in one or two instances), and, prejudice aside, it would not be easy to find more intelligent, well-posted, earnest seekers after truth, and zealous teachers of what they know, in any profession, in any land. The consequence of all this is that the 'Doctor of Dental Surgery' in America occupies a social position, as well as a civic rank, in nowise inferior to the 'Doctor of Medicine' or 'Law;' and after two full courses of anatomy (with dissections), physiology, chemistry, and natural philosophy, principles of medicine, such portions of materia medica as belong to our specialty, dental physiology and operative dentistry, mechanical dentistry, and metallurgy, together with occasional attendance at the lectures and clinics of the medical schools (all of which are accessible to dental students), the graduate of an American dental college cannot be justly considered very inferior in general attainments to his medical brethren. The dental diploma affords every necessary guarantee for any dental appointment, and though many who have the opportunity may be disposed to take the degree of Doctor of Medicine in addition, still in relation to dentistry they occupy no higher position.

"The dental profession in America is rapidly progressive. There is something in the American character which is essentially progressive. In commerce, in art, in agriculture, in science, and in politics, the spirit of the nation is *progress.* In connection with the dental profession, this spirit is evidenced by the numerous societies which have been formed during the past few years, until at length it is regarded as an opprobrium resting on a State not to have its Dental Society. State, county, and city societies, American Dental Association, indicate the progressive tendency of the profession. Then, again, in practical matters of everyday duty an improved method of treatment, any new material, a fresh kind or form of instrument, amended appliances of all sorts, are at once tried and liberally discussed. Occasionally, perhaps, this readiness to adopt new

devices may involve a little trouble, or possibly subject operator or patient to slight inconvenience, but, as a rule, the old proverb holds good, 'Nothing venture, nothing have;' and it comes to pass that those who are willing to learn seldom fail of something to learn, and those whose minds are open to the conviction that possibly some one else knew better than themselves generally receive the most good, and become able to do most good in the world. The progressive character of American dentistry is still further shown by the quality of the articles which appear month after month in the several periodicals, all of which are well furnished with abundance of original communications. Another proof of advancement is afforded by the fact that the meetings of societies are always open to dentists, dental pupils, or dental students at any college, all of whom are usually invited to take part in discussions, etc., if they feel so inclined. A common interest and common love for similar pursuits, a common desire for the elevation of their profession, seems to actuate the brethren, and serve as a bond by which they are united in a common cause.

"The dental profession in America has earned a large share of public appreciation. An English practitioner, lately settled in Yorkshire, remarked the other day that 'some of the people seem to consider a dentist as something midway between a veterinary-surgeon and a tinker!' There is no danger of such 'latitudinarian views' being entertained of a dentist in America. The result of this appreciation is that the practitioner is well remunerated for the time and pains he spends on a case. Instead of a fixed charge, a scale is adopted, *e g.* a simple gold filling of small size, two to four dollars; large filling of same character, six, eight, or ten dollars, according to the amount of time and gold consumed; when a tooth requires previous treatment, the fee increases in proportion to the number of visits necessary; in many cases first-rate operators receive as much as twenty to twenty-five dollars for a large gold filling, while some in difficult cases obtain as much as fifty dollars for one filling. The amount of attention paid to this department has raised the quality of the work to a point of which few English operators have any idea. The beatiful and delicate instruments commonly used for gold filling are up to the present time not obtainable in this country at all, except through the agents of American manufacturers. The efficiency and elegance of these operations at once explain the readiness with which large fees are obtained.

"In the mechanical department, so far as the general quality of the teeth, the making of plates, fitting, etc., are concerned, the American dentist is, with few exceptions, inferior to the English; but the extent to which vulcanized rubber has been adopted in general art, combined, possibly, with other facilities, has resulted in the production of a quality of that article which for toughness, easy manipulation, and durability, is certainly unsurpassed, if even equaled.

"The production of this article is monopolized by a company, a fact which is to be regretted. Work made of the very natural-looking sectional gum teeth manufactured by S. S. White and others, and the company's rubber, is quite equal, if not superior, in appearance to that composed of single teeth and English pink rubber. Altogether, however, the mechanical department is not considered equal in importance to the surgical. Conservative practice obtains to a much greater degree than that which favors the early introduction of artificial teeth. This is accounted for by the fact that the public estimate highly the value of the

natural organs. The remunerativeness of operative dentistry removes the temptations which beset those who, always receiving a fixed amount for all sorts of operation, are liable sometimes to remove a tooth, and so make way for further work, when, had proper remuneration offered, they might have preserved the natural tooth. The American dentist frequently prepares many of his materials himself, preferring the extra trouble and labor to the uncertainty which encircles him if he trusts to the opinions or convenience of the numerous depôt proprietors who abound in all the large cities. Amalgams, osteo-plastic, white gutta-percha, Hill's stopping, medications of various kinds, mineral teeth (many of which are exceedingly beautiful), tooth powders, mouth washes, *cum multis aliis*, are not at all infrequently concocted and manufactured in the private laboratory. The furniture and 'fixings' of an American dentist's office are somewhat attractive to English eyes. Usually the whole ground-floor is devoted to the purpose. Entering from the hall, the visitor finds himself in a spacious, richly furnished room, communicating by folding doors, which are thrown open, with an inner apartment similarly appointed; beyond the latter a partition or screen of glass doors, sometimes hung with light drapery, marks off the 'sanctum sanctorum.' In the outer or waiting rooms patients are seldom kept long; all is done by appointment, and thus the wearisome sitting for hours, which many of our English patients have to endure, is avoided, engagements being often made for weeks or months ahead. Within the office proper there is nothing striking; the operating chair, spittoon, and cabinet are the principal objects. Any display of instruments or attempts at fanciful decorations are simply avoided, the quiet characteristic aspect of the whole impressing the mind as suitable for the purpose. The operator appears attired in a costume the convenience of which is in excess of its elegance. In New York the fashion is to wear a loose blouse made of stout holland, which, when washed, looks nearly white. In other cities very light and easy garments, sometimes a handsome dressing-gown, are worn.

"If (as repeatedly occurs with the best operators) others are present, they stand at a respectful distance, watching the case, and offer any remarks in a low tone, as a matter of ordinary courtesy, abstaining from criticism unless invited to give it by the operator. In this connection some things suggest themselves which excite a doubt as to the desirability of carrying out such freedom of action to the extent some American dentists do. It is, however, simply absurd to attempt to construe American customs by English rules; and, in conclusion, it may be remarked that this sketch was not introduced to exhibit unfavorable 'spots' in the character or position of the dental profession in America, but rather to bring into view some aspects of it which may command admiration and incite to similar activity and zeal.

"May the profession to which we have devoted our lives, our talents, and our energies, be to us and to our American brethren, not only a means of subsistence, but a medium through which our characters may shine in benevolent desires to mitigate the sufferings of our common humanity; and may it serve also as a further bond of union between these two mighty nations, already bound by so many ties, so that together we may advance in knowledge, in skill, and in all that pertains to the development of the wonderful faculties with which a bountiful Creator has endowed us all.

"10 Oxford Street, Liverpool."

PERISCOPE OF MEDICAL AND GENERAL SCIENCE IN THEIR RELATIONS TO DENTISTRY.

BY GEO. J. ZIEGLER, M.D.

"*On Neuralgia and Hyperæsthesia.* By C. HANFIELD JONES, M.D., F.R.C.P., F.R.S., Physician to St. Mary's Hospital and Lecturer on Medicine.—The view which I have advocated respecting the essential nature of neuralgia and hyperæsthesia is strongly supported by the occasional occurrence of acute pain and tenderness in limbs affected with embolism of the main artery. Motor and sensory paralysis are constant, but in some instances there is also pain and hyperæsthesia. A case is recorded in the *Dublin Quarterly Journal of Med. Sci.*, May, 1862, of embolism of the right common iliac, femoral, and lower arteries. The symptoms were sudden acute pain in the calf of the leg, which was so tender that the patient shrieked when it was touched, loss of motion in the limb, and loss of sensation from the knee downward, with remarkable diminution of the temperature. In the case of a female, recorded by Dr. Fuller, who died in thirty-five days with gangrene of both lower limbs, depending apparently on spontaneous coagulation of fibrine in the arteries and veins, which were healthy, the first symptom was acute pain, which set in suddenly without obvious cause. The whole limb, it was said, was so exquisitely tender that the slightest touch caused intolerable pain; it presented, however, no unusual appearance, and no difference could be detected between the two limbs. Even a week later all that could be observed in the painful limb was a slightly greater fullness of the superficial veins, and a somewhat lower temperature; the difference, however, in color and temperature was so slight as hardly to attract attention. Mr. Erichsen describes arteritis as attended with excessive sensitiveness of the surface, so that the patient cannot bear the finger to be laid upon it; the pain is of a smarting and pricking character, and is always associated with more or less loss of muscular power. The inordinate sensibility continues, he says, after the limb has become cold, livid, and pulseless, but yields to complete anæsthesia as gangrene advances. The examples I have cited afford, it appears to me, quite sufficient evidence that both neuralgia and hyperæsthesia in their purest forms occur under conditions of lowered vital and nervous power, and that hyperæsthesia is quite independent of any increase in the blood-supply of the suffering part. That a state very similar to hyperæsthesia often occurs also as the result of inflammation is, I think, certain, but it is to be ascribed, not to the local afflux of blood, but to the lowered vitality of the parts involved in the morbid process, which, as is now well known, always implies a tendency to degeneration and decay.

"Besides the morbid modifications of sensibility already noticed, there are various common derangements of this property, such as itching, formication, burning, trickling of cold water, and the like. These are often regarded—at least, some of them, viz., pain, temperature, and contact—as being the result of impressions made on different nerve-fibres; and this view is supported by the fact that the consciousness of one of these impressions may be lost, while it is retained of the others. The great multiplicity of separate nerve-fibres which would be required on this hy-

pothesis has always seemed to me a weighty objection against it; and I do not see any more difficulty in comprehending that one and the same fibre may be capable of conveying different impressions than there is in the fact that the same wire may convey to the hand vibrations, caloric, and electricity. The phenomena of color-blindness seem to militate against the theory. Considering the great variety of colors, and the very varying degrees of this defect, it would seem impossible to suppose that there can be different fibres in every part of the retina, for all the colors and tints which some persons are unable to distinguish, and for which, in them, according to the theory, the perceptive media would be wanting or paralyzed.

"With regard to this subject I have been favored with the following communication by Dr. Southey Water. He states that about four years ago he was studying the spots on the sun through a telescope, having previously shaded the eye-piece with a double layer of smoked glass. He was not conscious at the time that the eye had received any damage, but subsequently he has found that there is a considerable difference between the right and left eye in the faculty of appreciating colors, the normal tints as viewed with the left eye being replaced by duller and dirtier shades in the picture conveyed by the right. Strange to say, however, the right eye, which gives such false representations of color, is the best for the definition of objects; he can read better with it than the left. The right pupil is slightly larger than the left. He has favored me with the accompanying tableau of the differences in color perceived by the two eyes, but states that the differences in the colors of flowers and of painted windows are much more striking than he can depict on paper. Sometimes he fancies that with the right eye he can see colors properly with the very oblique rays, while all the direct ones give a false image, as if one central spot in the retina where the image of the sun rested was alone affected. An ophthalmoscopic examination detects nothing abnormal in the eyes.

"It appears in this case that the retinal fibres, at least in the central area, have suffered a paresis as respects their power of appreciating colors, while in other respects their functional capacity is unimpaired. It is impossible to believe that there exist different fibres for colored and for white lights.

"Dr. Basham has kindly communicated to me the case of an artist who, during convalescence from fever, found that all reds appeared to him as greens; the perception of the latter was not altered. Under the use of quinine and iron his retinæ regained their normal state. Here there was evidently a paresis of the nerve-fibres with regard to a particular kind of impression.

"There is no doubt that the sense of taste is ministered to by more than one nerve; the glosso-pharyngeal, the gustatory, and the palatal branches of the fifth are all capable of conveying impressions of this kind to the sensorium; and all these nerves are also fitted to convey impressions of contact, and the glosso-pharyngeal the peculiar one of nausea besides. Again, the great variety of impressions which the nerves of taste convey has a bearing on this question. To my own mind, there seems little room for doubt that one and the same nerve-fibre is capable of being thrown by different excitants into different states which affect the sensorium with different impressions. If this be true of the peripheral nerves, it probably is true also of the nerve-centres. To this point we shall return.

"The actual *seat* of neuralgia and hyperæsthesia is, in many instances, a matter of great uncertainty. We know well that these disorders may depend on a central lesion, but it is often no easy matter to determine whether such is the case or not. Even where there is no organic alteration, the morbid action may be central, or perhaps both central and peripheral, extending along the nervous cords in their whole length. Such appears to be the case when the pain darts up and down the nerve, as it does in some cases of sciatica, or as in other instances where it radiates in a reflex manner from the nerve first affected to various others. Indeed, as we have every reason to believe that the nervous influence is propagated along its paths by molecular change passing instantaneously from particle to particle, it seems that we can hardly speak of nervous disorder as limited to the centre or periphery, except in those less frequent cases where a manifest cause of irritation is discovered in some part of the tract. If a tumor, a decayed tooth, or the like, vex and irritate a sensory nerve, we may say the morbid action originates at the periphery, but we cannot say this in a case of gouty or malaria-engendered neuralgia, where as nerve and centre are alike exposed to the toxic influence contained in the blood, it is reasonable to conclude that both suffer simultaneously. The centre involved in most instances is the inferior one, where the nerve appears to be directly implanted, but it is interesting to observe that in cases of great severity other centres become engaged, first those giving origin to other nerves and then the superior, the emotional, or intellectual, as evidenced by the occurrence of hysterical disorder or delirium. The widely-diffused hyperæsthesia of hydrophobia affecting the skin, the mucous membrane of the throat, the eye, and the ear is in all probability central as well as peripheral.

"It is of some practical interest to have correct views as to the seat of neuralgia and hyperæsthesia, especially with regard to the use of local applications. I am by no means skeptical as to their frequent efficacy, but I think it is very doubtful whether they act, as they are often supposed to do, directly on the nerves affected. It is too much to suppose that an external application of belladonna or aconite should make its way through thick layers of skin, fat, and fascia—not to say muscle—to reach and act upon the sciatic nerve, and if it did, beyond all question grave toxic effects would ensue. Still, we find ourselves, as it were, instinctively applying our remedies as near as may be *loco dolenti*, and I am not prepared to say that this is not right. Assuming, however, that it is, I think the benefit produced must be ascribed to the influence exerted on the cutaneous nerves to which the remedy is directly applied, and which is propagated from thence to the region of the cord where the roots of the suffering nerve are implanted. It is certain that the nerves of the surface acted on must be affected, and that the subjacent trunk cannot be directly; so that there seems no other mode of accounting for the beneficial effect except that suggested. This *modus operandi* would be the beneficial homologue of the reflection of pain. Just as a morbid stimulus, an irritant, applied to one part, generates pain in a remote by being reflected on to its nerve, so a beneficial stimulus being propagated in a like way may annul a morbid condition set up in a centre by impressions transmitted to it from a focus of irritation. It is, however, very conceivable that this result is more likely to ensue when the nerves, stimulated with a curative intention, have their central terminations near those of the nerve fibres which are in a morbid state. A very interesting paper by one of

the *Προμαχοι* of the host of scientific inquirers, Dr. Lionel Beale, sets forth grounds for the view that the caudate nerve cells are not the points from which nerve currents radiate in different directions along single fibres, but rather the common points where a number of circuits, having the most different distribution, intersect, cross, or decussate. The so-called cell is part of a circuit, or rather of a great number of different circuits. If this be the case, it adds much to the probability that an agent operating upon one nerve may affect thereby other filaments continuous in the centres with those of the former. It is remarkable that even neuralgic pain depending on organic lesion may be relieved by remote applications. Mr. Tomes mentions that a mustard poultice or ammonia applied behind the ear will be effective in some few cases of toothache, and may be tried with considerable hope when other remedies have failed. Mr. Little testifies from personal experience to the great efficacy of chloroform applied to the temple in two severe attacks of rheumatic inflammation of the eye, in which the pain came on periodically with extreme severity. The chloroform is applied in a watch-glass, so as not to evaporate, and produces a burning sensation locally. He praises its efficacy in a great variety of neuralgias. Dr. Weber tells me that he has repeatedly witnessed the good effect of chloroform applied to the ear in stopping a toothache for a time. It is clear that in both these instances the remedy acts as a local stimulant, exerting an influence on the nerves of the surface to which it is addressed, which modifies the condition of other connected nerves."—(*Med. Times and Gaz.*)

Carbonic Acid as an Anæsthetic.—"M. DEMARQUAY, believing that, amid the contradictory statements which have been published concerning the physiological action of carbonic acid, further inquiry was desirable, instituted numerous experiments upon animals and upon himself, as well as upon several of his pupils, his object being more especially to ascertain the amount of the gas which may be contained in an artificial atmosphere without this becoming irrespirable and poisonous, and to examine the degree of anæsthesia which may be obtained by its agency. The following are the conclusions of the memoir which he has just presented to the Academy des Sciences:—1. Carbonic acid exerts a stimulant action upon the surface of the body, which is marked in proportion as the skin is more delicate and endowed with greater sensibility. The regions of the penis and perineum are more especially sensitive. 2. Analgesia, 'when it can be obtained,' is only produced by means of a continuous jet of the gas playing upon a very limited portion of the body. 3. Its action on the senses is of the same character as that exerted upon the external integument, inducing, consequently, vivid excitement, sensorial exaltation, or nervous perturbation,—phenomena which are generally only fugacious. 4. It exerts a stimulant action on the alimentary canal, which is accompanied by a slight nervo-vascular irritation. 5. When injected into the veins, it is absorbed in large quantities, and eliminated with rapidity, when the operation is conducted with proper precautions; or it may act mechanically by producing considerable distention of the cavities of the heart, and consequent death. 6. Introduced into the economy by the respiratory passages, carbonic acid does not give rise to those toxical accidents which have been so often attributed to it. In fact, in the dose of $\frac{1}{5}$, or even $\frac{1}{4}$ to $\frac{4}{5}$ or $\frac{3}{4}$ of atmospheric air or oxygen, mammalia can breathe it for a long period without seeming to be seriously incommoded.

In man, some disturbance, and that of a slight character, is produced only at the end of a period, which varies according to the amount of individual susceptibility, but which is generally sufficiently prolonged to admit of the production of a therapeutical agency, if the employment of the gas were indicated. The lesions found after death, whether in man or animals, do not resemble those which are caused by a toxical agent with which carbonic acid has been often confounded, viz., oxide of carbon. 7. Most of the accidents produced by the vapor of carbon, confined air, the fumes of fermentation vats, wrongly attributed to carbonic acid, should in great part be imputed to carbonic oxide, sulphuretted hydrogen, alcoholic vapors, or other little known gases which originate under such circumstances. 8. Carbonic acid is simply irrespirable, and although it is not so in the same manner as azote or hydrogen, it is not for that reason more hurtful than these gases. Respiration essentially consisting in an interchange of gas between the blood and the air, and such interchange not being possible, as proved by the laws of physics, except between gases of different natures, it is obvious that carbonic acid when respired in the pure state presents a material obstacle to the pulmonary function, and consequently induces asphyxia. Azote and hydrogen, although unsuitable for playing the part of a vital agent in hæmatosis, and, in fact, irrespirable, are so in a less degree than carbonic acid, because different in their nature from the gas to be eliminated, the interchange can be effected during some instants. 9. The very positive phenomena of anæsthesia obtainable by the agency of this gas in many animals do not seem to be producible in man without danger of asphyxia. Moreover, supposing that anæsthesia thus produced was sufficiently complete, it would still be too fugacious to be of utility for surgical operations."—(*Ibid*)

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Art of doing Good.—"The art of doing good has, like all other arts, certain fixed stages of progress. In the rudest states of society it does not exist at all; the notion of doing good to others only dawns upon the mind when the rays of true religion first dawn on the primeval selfishness of animal nature. When first the impulse is felt it is, like other impulses, unreasoning, impetuous, aiming at its main object without regard to other consequences. 'There's a poor man: give him something!' That is the first cry of a child who feels the instinct to do good; and it is the first essay of any society whose sense of benevolence has been stirred, while its powers of seeing into and thinking out distant results are yet dormant. It is empiricism in its worst and most childish form. There is a hungry man: give him food! There is a man without work: make a job for him! Here are sick people: build them a hospital! Here are poor women scantily furnished with the comforts needful for child-bearing: build them a lying-in hospital! Here are poor girls seduced and betrayed: build them an institution! Here are babies murdered or deserted: build them a foundling hospital! All these things belong to the age of doles, almshouses, hospitals, charitable bequests, poor-laws, and the other clumsy machinery of the first untutored efforts of beneficence.

"After awhile comes a scientific era, even in the art of doing good. Then the benevolent cease merely to gratify their own instinct by 'giving,' or by supplying a patch to the most obnoxious ulcer of the times. The truth comes to be found out that all help from other people which induces the poor to rely on it, and not to exert their own industry, frugality, and self-control, is a curse, and that to do good it is needful not

only to relieve a pressing want or scandal, but to dive into the causes and strike at the root of it. Then it is seen that indiscriminate giving is a cause of idleness, beggary, and profligacy, and that the most lazy, vicious, and immoral districts are usually those where 'charitable institutions' most abound."—(*Ibid.*)

Monstrosities.—"The laws of fœtal evolution have been so successfully studied during the present century that we are now enabled to solve many problems heretofore incomprehensible, with regard both to the *nevi materni* and to the malformations or monstrosities, as they are technically called, which we occasionally meet. Among the principles which bear upon our subject, the following may be mentioned:

"1st. That, with the exception of the heart and organs of digestion, the early product of conception consists of two lateral and symmetrical halves, which subsequently come together and are agglutinated upon the median line so as to constitute one body.

"2d. That the process of evolution proceeds from the periphery to the centre; those portions most remote from the median line being formed first, and the others last. Hence, the fingers are formed before the hand, this before the forearm, and the arm proper still later; the ears exist before the eyes, these before the nose; and so also with regard to the trunk.

"3d. That any arrest or cessation of evolution before it be completed must result in malformation, corresponding to the stage of evolution at the time of its arrest. If, for example, the hand has been eked out of the body, the process of evolution be arrested, the child will be born with a hand where the shoulder should be, and consequently with neither forearm nor arm. If, after the formation of the ears, head, and eyes, there be no further evolution, and the two halves become then agglutinated, the nose and the central portions of the upper jaw will be wanting at birth. Cyclops are thus formed by the union of the lateral portions of the head just at the time when the outer half of each eye has been completed. The arrest of evolution leaving only one-half of each eye formed, these halves have come together so accurately as to resemble one perfect eye on the median line. Cyclops can never have a nose, because of the arrest of evolution, and of the union which has taken place before it could be formed.

"4th. The failure to unite the two halves at any point of the median line must leave fissures where none should exist. Hare-lips and cleft palates are thus produced.

"5th. Whenever two products of distinction or distinct fœtuses become united during their evolution, the connection always occurs between homologous parts; or, in other words, parts dissimilar in the two never unite. Union takes place of face to face, back to back, sternum to sternum (as with the Siamese twins), shoulder to shoulder, etc.; but we never find the face of one united to the back of another, nor the shoulder to the hip, nor any union of parts dissimilar.

"6th. The process of evolution may be excessive as well as incomplete; when excessive in certain portions of the capillaries, those blood-vessels, which are, in the normal state, too small to be seen with the naked eye, now become so large as to carry red blood and to impart to the locality (if in the skin) a corresponding degree of redness. This is the way in which marks are formed. An excess of evolution may also produce supernumerary fingers or other appendages."—(PROF. A. DUGAS, M.D., *St. Louis Med. Reporter.*)

"*Development of the Buccal Cavity.*—According to Herr Török's inquiries, the buccal cavity is developed from a thickened expansion of the same layer of embryonic cells from which the cerebral nervous system, the olfactory organ, the retina, and the vesicles of the labyrinth take their origin. The thickening takes place just above each of the two olfactory organs. As the sinus increases in depth, it ceases to be in a right line with the visceral cavity. The other details of Herr Török's memoir are too technical for abstract in these pages. The paper was originally read before the Society of Sciences of Göttingen."—(*Lancet.*)

"*The Teeth as Passive Organs of Speech.* By S. JAMES A. SALTER, M.B., F.R.S. Guy's Hospital Reports.—In this paper the author describes the part played by the teeth in the formation of articulate sounds, but he also enters into the consideration of the mechanism of these sounds generally, giving what he terms a physiological alphabet, the arrangement being based upon the situation of the closure of the mouth by which the sound is produced, upon the completeness or incompleteness of the closure, and other circumstances. Mr. Salter incidentally remarks that the grammatical distinction drawn between vowels and consonants is not founded on physiological data, for certain consonants may be sounded by themselves, as S and V, if whispered; and almost all articulate sounds may be pronounced in a whisper without any vocalization. The practical part of the paper describes the injury inflicted upon the speech by the loss of teeth, and the mode adopted by nature to compensate the injury by the adaptation of the soft parts to the purpose of articulation. When an individual has accustomed himself to the exercise of speech after the loss of teeth, he is at first incommoded by their artificial restoration, but those persons will ultimately have the best articulation who repair the loss by artificial means."—(*British and For. Med.-Chir. Rev.*)

"*On Papillary Tumors of the Gum.* By S. JAMES A. SALTER, M.B., F.R.S. Guy's Hospital Reports.—Of the two cases referred to in this paper, one occurred in the practice of Sir William Fergusson, at King's College Hospital, and the other in that of Mr. Cock, at Guy's. In the first case the previous history was very imperfectly known; and as the patient, who was an aged man, died from natural decay soon after the tumor was operated upon, the question of its malignancy could not be determined. In the second case, Mr. Cock removed the morbid growth, and no recurrence of the disease was observed three months after the operation. Mr. Salter considers that the histology of the morbid growths is identical in the two cases, and he regards them as instances of a non-malignant disease, the tumors being found, on microscopical examination, to consist of hard fibrous tissue surmounted by papillæ, and the latter mainly composed of dense coherent epithelium."—(*Ibid.*)

"*Salivary Secretion.*—SCHLUTER, in the secretion of the submaxillary gland of the dog, obtained by nervous irritation, found, besides numerous faintly reflecting, acetic acid resisting, droplets of 0·003—0·046mm. diameter, two different forms of saliva-corpuscles, one pale, and moving in the manner of the amœba, processes pushed out and drawn in, the other globular and granular with molecular motion within. The

author could change the corpuscles of the first kind by addition of his own spittle or distilled water into those of the second kind, the familiar saliva-corpuscles out of the mingled saliva, and considered these changes as following a coagulation of the living protoplasma. Then the saliva discharged at the commencement of the investigation contained but few corpuscles, but, during the irritation, the number of the latter continually increased, so he derives the origin of the corpuscles from the nerve excitation; this shall first bring about increase of the nuclei (by division), and then division of the protoplasma (by contraction). A granular shapeless mass, which is found in the first place in the discharged secretion, he considers as a detritus proceeding from the accumulated destroyed saliva corpuscles."—(*Zeitschrift für rationelle Medicin* and *British and For. Med.-Chir. Rev.*)

"*Contents of Sputa.*—M. N. Friedreich describes the following bodies as having been met with in sputa.—*Brit. Med. Journal.*

"1. *Bone.*—A patient suffering from tuberculosis, and vertebral caries, frequently expectorated pieces of bone, of the size of peas. They had the appearance of carious spongy bone, and under the microscope presented the true osseous structure. They evidently came from the vertebral column.*

"2. *Hæmatoidine.*—A patient, who had pleurisy in the left side, was seized with circumscribed pneumo-thorax, and pyopneumo-thorax, preceded by very severe pain, dyspnœa, and purulent expectoration. Examined under the microscope, the sputa were found to contain innumerable crystals of hæmatoidine. Crystals of the same substance were also found in the pus contained in the pleura.

"3. *Tyrosine.*—A woman expectorated fibrinous casts of the bronchi, of a dirty gray color. Under the microscope they were seen to be composed of pus-cells, undergoing fatty degeneration, and of a finely granular detritus, imbedded in a fibrinous mass. There were also a large number of colorless crystals, having different shapes, but generally in the form of very long and fragile quadrangular octohedra. These were, M. Friedreich says, crystals of tyrosine.

"4. *Amylaceous Corpuscles and Sarcinæ.*—A woman had narrowing of the mitral orifices, thrombus in the right auricle, and in the pulmonary artery, hæmorrhagic clot in the apex of the right lung, and secondary pleurisy. She expectorated amylaceous bodies, having as their centre a dark or crystalline pigmentary mass; the sputa also contained very minute sarcinæ. These did not come from the mouth or stomach, but from the deeper parts of the air-passages."—(*Med. and Surg. Reporter.*)

"*Epulis.*—Reported by Dr. Napheys. Surgical Clinic of Prof. Gross, Jefferson Medical College.—Sarah ——, æt. 25. She has a tumor of the upper jaw, denominated epulis. It is of fibroid character, with more or less epithelial matter in its interior, and springs from the socket of one or more of the teeth. It does not grow merely from the gum, as the term epulis would signify.

"The tumor could readily be shaved off, but this would not insure immunity against its recurrence. It is necessary to remove a portion of the jaw-bone itself, otherwise the operation would be worse than useless.

* Calcareous matter from degenerated tubercle may also be expectorated.—Z.

"Two teeth were extracted, and by means of the bone forceps, described by Scultetus, a portion of the jaw-bone was removed with the tumor.

"The mouth was ordered to be washed daily with a solution of permanganate of potassa, to allay fetor, and keep the part in a comfortable condition. There is no probability that the saliva will be swallowed to an injurious extent, though it sometimes happens after operations involving a large portion of the jaw, that life is destroyed by the deglutition of the secretions of the mouth or nose."—(*Ibid.*)

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"*Epithelioma among the Kashmiris.*—MR. EMSLIE tells us that in May, 1865, a Medical Mission Dispensary was established in the capital of Kashmir, and remained open till the end of the season (the middle of October), when Europeans migrate to the hills. Some five thousand and eighty cases applied for relief, and out of these there were thirty cases of epithelioma, proved by the general and minute history of the instances—that is to say, one case in every two hundred and fifty-four patients. There are differences observable in reference to the disease as it occurs in Kashmir and England, especially as to its seat; for while in England it occurs rarely before forty, in seven of the twenty cases of Mr. Emslie it appeared earlier, and in one case in a child three years old. It has great predilection for the abdomen and inner parts of the thigh. In the twenty cases mentioned the disease was situated in one of either of these two parts. This is accounted for by the fact that men and women, young and old, are in the habit of carrying about with them what are called *kangris*, earthenware pots, covered with wicker-work, and more or less ornamented to suit the price and taste of the buyer—in fact, they are portable braziers, in which they burn charcoal; and in cold weather these are carried next to the bare skin of the belly, under the loose garment which is worn, and when in doors or in a sitting position are placed by the Kashmiris between the thighs. Mr. Emslie thinks that it is to the use of the *kangri*, and its contact with the belly and thighs, that the determination of epithelioma to the spots named is to be attributed. The fact harmonizes well with the occurrence of epithelioma in the lower lip in inveterate smokers of *short* clay pipes."—(*Lancet.*)

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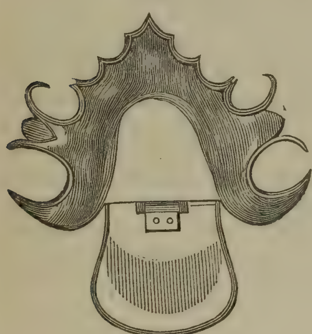
"*Adaptation of Artificial Palates.* By GEORGE PARKINSON, M.R.C.S., Dental Surgeon to Charing-Cross and West London Hospitals.—Having formerly been house-surgeon at King's College Hospital, under Sir William Fergusson, my attention, soon after taking up the dental specialty, was directed to those cases of fissure of the palate, whether congenital or morbid, which were not amenable to surgical treatment, and having now had the experience of forty-eight cases treated on the principle hereafter described, I feel justified in introducing the apparatus to the medical profession. It sometimes happens in cases of congenital fissure of the palate, that the margins of the velum are so far apart as to preclude the possibility of uniting them by surgical operation, and the case then comes fairly into the hands of the dental surgeon.

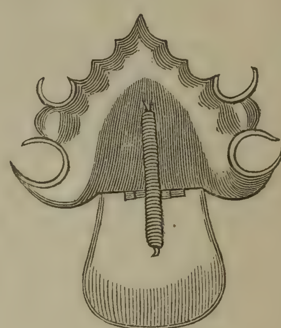
"There are three evils susceptible of remedy by artificial palates: first, defective enunciation; second, the escape of solids and fluids through the nasal passages; third, difficulty of swallowing.

"As congenital cases require a special arrangement of the apparatus to be employed, it will be better to consider these cases first, and after-

ward the more simple treatment required, where the palate or portions of it have been destroyed by sloughing of the soft and necrosis of the hard tissues. It is not my intention to occupy time and space in describing the various mechanical arrangements which have from time to time been introduced, but merely to give a sketch of the method of treatment I have found the most simple and successful, at the same time acknowledging I was originally indebted to a paper by Mr. Stearns, which appeared in *The Lancet* of the year 1845, for valuable suggestions in the treatment of similar cases.

"In a case of congenital fissure of the palate extending through the hard tissues and alveolar ridge, after having taken a correct model of the parts in wax or plaster of Paris, I commence by fitting a thin plate of gold over the vault of the palate, as far back as the posterior margin of the palate bone would have extended had the bony arch been perfect. To the posterior margin of this plate, by means of a hinge, is attached a velum, constructed of hard, well-polished, vulcanized India-rubber, formed


Palatine surface.


Nasal surface.

in such a manner as to fit the palatine surface of the remnants of the soft palate and allow them to glide over it in the act of deglutition. To keep the velum in its place, one end of a delicate gold spiral spring is made fast to it, the other end being fixed on the nasal surface of the gold plate representing the hard palate. This spring must be so adjusted as just to keep the India-rubber velum in contact with the soft parts, and allow the portions of uvula on either side to approximate in the act of deglutition. Each particular case may require some slight modification, but all that I have treated on this principle have been, I think, highly satisfactory. The voice is not always immediately improved, as education of the tongue is necessary in all congenital cases. The patients for whom I have constructed these palates have, without any exception, expressed great comfort from their use, the only inconvenience ever complained of being a slight nausea on the instrument being first introduced, which generally passes off after a few minutes. The materials used are perfectly durable. The only part that could possibly get out of order is the spring; but this would only be the result of careless manipulation out of the mouth, and could easily be repaired at a trifling cost.

"In constructing an artificial palate in cases where both bony and soft tissues have been lost by disease, I do not deem it necessary to have a hinge or spiral spring. I then make the vulcanite velum a fixture to the

gold plate fitted to the anterior part of the mouth, or construct the whole of gold or vulcanized India-rubber. In these cases the voice is immediately restored to its natural tone, and, the fluids not being permitted to escape through the nose in the act of drinking, the comfort of the patient is wonderfully enhanced. I do not think artificial palates can be adapted with advantage to children under twelve years of age, and that ordinarily sixteen is quite young enough; although I have, at the urgent desire of the parents, fitted them to patients of thirteen. In cases where the fauces are particularly irritable the bromide of potassium might be used with benefit; but never having had occasion to employ it, I cannot give an opinion as to effect."—(*Ibid.*)

"*Decay of Gutta-Percha and India-Rubber.*—From a report made some time since to the Chemical Society—England—by Prof. William Allen Miller, M.D., F.R.S., it seems that India-rubber and gutta-percha when exposed to the atmosphere, gradually absorb oxygen, and combine with it to form resin; acting in this respect like other hydrocarbons. Prof. Miller says:

"'The inquiries to which this investigation has given rise have extended over many months, and have included a large number of analyses, but the results obtained may be stated in a small compass, as they are very definite. I have examined numerous samples of gutta-percha cables, both injured and sound, which have been in use for several years, and I find in all cases that the deteriorated portions have undergone chemical change, and that change consists in a process of oxidation.

"'Whatever retards or prevents this oxidation, retards or prevents the decay of the gutta-percha, some of the specimens which I examined being as good as new, though they had been manufactured and used electrically for years; while others in a few months had become brittle, rotten, and unserviceable. As the general result of these inquiries, I find that, whenever the gutta-percha has been completely submerged in water, no injurious change has occurred, sea-water appearing to be eminently adapted to the preservation of the gutta-percha. On the other hand, alternate exposure to moisture and dryness, particularly if at the same time the sun's light has access, is rapidly destructive of the gutta-percha, rendering it brittle, friable, and resinous in aspect, and in chemical properties. A gradual absorption of oxygen takes place, and the gutta-percha slowly increases in weight, becoming at the same time proportionately soluble in alcohol, and in dilute solutions of the alkalies. In every instance, however, some portion of the gutta remained unchanged in composition.

"'My experiments have also been extended to the prolonged action of air, moisture, and light, upon India-rubber, and here also I find that these agents effect analogous changes, though somewhat less rapidly.

"'The caoutchouc, however, instead of becoming brittle, is converted into a glutinous mass, losing its elasticity, increasing in weight to a certain extent, and becoming partially soluble in alcohol and diluted alkaline liquids.

"'These deductions are made from the examination of a number of samples supplied to me partly by Capt. Galton and Mr. L. Clark, including specimens of coated telegraphic wires suspended in air, specimens of submarine cables, specimens of wires sunk in the soil under various conditions, besides experiments instituted by myself upon the action of various agents upon gutta-percha, and they include the results of an ex-

tended and well-contrived series of experiments made at the works of the Electric Telegraph Company, under the direction of Mr. L. Clark.'

"Among the analyses given by Prof. Miller are the following:

"'Pure gutta-percha differs in some of its properties from the commercial gutta. I found on examining the whitest samples, purified by Dr. Cattell, that it formed a porous, milk-white mass, wholly soluble in benzol, in ether, in bisulphide of carbon, and in the ordinary solvents of gutta-percha. It is a perfectly pure hydrocarbon, probably containing $\overline{C}_{20}A_{30}$. I found it to consist of—

	Found		$\overline{C}_{20}H_{30}$
Carbon	88·96	or	88·88
Hydrogen	11·04	or	11·12
Total	100·00	or	100·00

"'When exposed to a temperature of 212° it softens, but does not liquefy; it loses a trace of moisture, and then gradually absorbs oxygen, becoming brown, brittle, and resinous in appearance In one specimen the increase in weight amounted to 4·45 per cent. The oxidized portion is insoluble in benzol, which, when digested on the brown mass, dissolves out a quantity of unaltered gutta, which had been protected from oxidation by the coating of resin.

"'This resinous mass when thus purified was found to have been produced from the gutta-percha by simple absorption of oxygen, the gutta having in one experiment absorbed more than a fourth of its weight of oxygen from the atmosphere.

"'The caoutchouc of commerce is, like gutta, not a pure vegetable principle, and consists of a hydrocarbon of definite composition, mixed with a small quantity of resin, the amount of which varies in different specimens.

"'The following are the results of my analysis of a sample of pure unmanufactured Para rubber, compared with a sample of good sheet masticated or manufactured rubber:

	Virgin.	Masticated.
Pure caoutchouc	96·6	96 64
Moisture	1·3	0·82
Resin	1 8	2·06
Ash	0·3	0·48
Total	100·0	100·00

"'Or, deducting moisture and ash, its elementary composition gave:

	Virgin.	Masticated.
Carbon	85·82	85·53
Hydrogen	11·11	12·06
Oxygen	3·07	2·41
Total	100 00	100·00

"'Caoutchouc, like gutta-percha, is, as already stated, liable to deterioration, by exposure to the action of oxygen in the presence of solar light, but the gum is less rapidly injured if exposed to their influence in the native state, than if it had been previously masticated. When subjected to the action of air excluded from light, it does not experience any marked change, even during very long periods. It is, however, import-

ant to observe that the masticated rubber is much more porous than the unmanufactured caoutchouc. When immersed in water, caoutchouc absorbs a much larger quantity of this liquid than gutta-percha, and the masticated much more than the unmanufactured or virgin rubber.'"—(*Scientific American.*)

"*A Wonderful Cement for Iron, etc.*—An exhibition of a most interesting character (says an English paper) took place recently at the Albion Works, Battersea, England. The exhibition consisted of a number of practical illustrations of the uses to which a certain description of cement is applied, having for its principal ingredient more or less of a particular gum or substance, called the zepipe—[it was called 'zopissa' in the authority from which we quoted in a previous number]—which for some years past has been identified with the name of Colonel Scezerelmey. It appears to be a most protean substance, for it holds on with wonderful tenacity to timber, glass, brick, cement; and last, though by no means the least of its remarkable qualities, *it will unite iron surfaces together as completely as though they were welded.* The cement has the quality of being perfectly water and air tight. It can be conveniently used, and hardens with the greatest rapidity. About five minutes is the maximum of time required for it to harden thoroughly.

"Of the value of such a material as this for engineering and building purposes, it is impossible to speak too highly. Our professional readers will at once perceive a variety of uses connected with railway and hydraulic works to which a material of this kind would be of the greatest possible value. Tunnels and bridges, docks and quay walls, could be constructed by its use in considerably less time and at greatly reduced cost; and with respect to sewers, an immense improvement would be effected in employing a material on which fluids produce no impression. Platforms and railway stations could be provided of equal strength to the present and with less consumption of materials. The invention is one of that character with respect to which there can be no mistake, and any person who sees may judge for himself of the properties of the cement, and we shall be greatly mistaken if some of our large contractors do not very shortly seek to test the practical value of this remarkable 'iron cement.'

"On previous occasions we have described the remarkable preservative qualities of the zepipe composition on stone and brick, and the extraordinary effects which the application of one part of the process has upon paper, converting it into a substance harder and more enduring than oak, and capable of being substituted for metals in many of the uses to which they are applied in the arts and manufactures. Following out the line of investigation into the chemical constituents of the subtances which he employs, the gallant colonel has now succeeded in producing some results, which if they had not been shown under our inspection, we should have hesitated to believe possible. By combining various substances which may be readily obtained in large quantities, and at almost nominal prices, the ingenious inventor has made what he calls this 'iron cement,' and truly it is an iron cement. It is a cement which, easily applied, becomes in a few minutes as hard as iron, and, so far as we are aware, this is a quality which is not possessed by any other substance—that of complete and perfect cohesion to iron. At Battersea we saw two large plates of iron held together so firmly as to defy all attempts at separating them.

The plates had in several parts been fractured by the attempt to separate the two surfaces, but they still remained firm and immovable. Two plates of iron were cemented together in such a manner as that the lower one could have suspended to it the weight of several tons; the projecting corners of the lower plate to which the weights were attached were bent and curved, and the upper and lower plates had 'buckled,' but they still remained held together by the thin layer of iron cement as though they were but one plate. By the side of this a plate has been made up of alternate thin sheets of iron and planks of timber, and the wood and the iron adhered as firmly as in the case when iron surfaces only were exposed to the action of the cement. A third test consisted of thin sheets of iron with alternate layers of paper, which had been previously coated with another kind of composition of M. de Scezerelmey's. There the same wonderful cohesion existed. A sheet of glass was fixed to the edge of an iron bar by this extraordinary cement, and was as firmly held as the iron, or wood or prepared paper of the previous experiments with iron and wood. Many other equally curious and startling experiments were shown, and among these a novelty in the way of a house some forty feet in length, the sides, flooring and roofing of which were entirely of paper. The exhibition is certainly a most interesting and instructive one."—(*Drug. Circ. and Chem. Gaz.*)

" *To Mend Broken Glass.*—A much better process for mending broken glass, china, and earthenware with shell-lac than heating them, is to dissolve it in alcohol to about the consistency of glue or molasses and with a thin splinter of wood or pencil brush touch the edges of the broken ware. In a short time it sets without any heating, which is often an inconvenient process. It will stand every contingency but a heat equal to boiling water."—(*Sci. American.*)

" *The Composition of Alloyed Metals.*—Below are a few of the alloys commonly used in the arts:

" *Chinese White Copper.*—Copper, 40·4; nickel, 31·6; zinc, 25·4; and iron, 2·6 parts.

" *Manheim Gold.*—Copper, 3; zinc, 1 part; and a small quantity of tin.

" *Bath Metal.*—Brass, 32; and zinc, 9 parts.

" *Speculum Metal.*—Copper, 6; tin, 2; and arsenic, 1 part: or copper, 7; zinc, 3; and tin, 4 parts.

" *Hard Solder.*—Copper, 2; zinc, 1 part.

" *Blanched Copper.*—Copper, 8; and arsenic, ½ part.

" *Britannia Metal.*—Brass, 4; tin, 4 parts; when fused, add bismuth, 4; and antimony, 4 parts. This composition is added at discretion to melted tin.

" *Plumber's Solder.*—Lead, 2; tin, 1 part.

" *Tinman's Solder.*—Lead, 1; tin, 1 part.

" *Pewterer's Solder.*—Tin, 2; lead, 1 part.

" *Common Pewter.*—Tin, 4; lead, 1 part.

" *Best Pewter.*—Tin, 100; antimony, 17 parts.

" *A Metal that Expands in Cooling.*—Lead, 9; antimony, 2; bismuth, 1 part. This metal is very useful in filling small defects in iron castings, etc.

" *Queen's Metal.*—Tin, 9; antimony, 1; bismuth, 1; lead, 1 part.

"*Mock Platinum.*—Brass, 8; zinc, 5 parts.

"*Ring Gold.*—Pure copper, $6\frac{1}{2}$ pwts.; fine silver, $3\frac{2}{3}$ pwts.; pure gold, 1 oz. and 5 dwts.

"*Mock Gold.*—Fuse together copper, 16; platinum, 7; zinc, 1 part."—(*Sci. American.*)

Amalgamation of Metals.—In a paper on this subject (*Chem. News*), Prof. M. J. NICKLES advances the following propositions:—1st, that "the metals which are wetted by mercury are permeable to it, and those which are not wetted are not penetrated by it."

2d, "when metals, which are not wetted by mercury, have been amalgamated by an indirect method, the mercury remains on the surface, does not penetrate into the depth of the metal, and consequently does not render it brittle."

"*Amalgam of Gold.*—Place one part of gold in a small iron saucepan, perfectly clean; add to it eight parts of mercury, and apply a gentle heat, when the gold will dissolve; stir the mixture for one minute, and pour it out on a clean plate. It is used for gilding brass, copper, etc. The metal to be gilded is first rubbed over with a solution of nitrate of mercury and then covered with a very thin film of the amalgam. On heat being applied, the mercury volatilizes, leaving the gold behind. A silver amalgam may be made by the same process."—(*Journ. App. Chem.*)

Filtration.—"A process of inverse filtration, by M. CAREY LEA, of this city, is described in *Silliman's Journal*, page 380, and promises to be very useful in certain cases. A piece of muslin, with or without filter paper inside, is secured over a glass funnel, and the latter is then inverted in the vessel of liquid to be filtered, an India-rubber and a glass tube being attached to the stem of the funnel, so as to convert the whole into a syphon, which being filled with water, will draw the liquid through the muslin, etc., thus filtering with considerable rapidity, if desired."—(*Jour. Franklin Institute.*)

"'*Poor Man's Filter.*'—In the food department of the South Kensington Museum stands the 'poor man's filter.' It is an ordinary flower-pot, plugged (not tightly) at the bottom with sponge. A layer of coarsely powdered charcoal, about one inch thick, is placed in the bottom of the pot, then another layer of sand of the same thickness, then pebbles, coarse gravel, and stones are placed on the whole. This forms an admirable filter, and one within the reach of the poorest."—(*Medical and Surgical Reporter.*)

"*Improved Putty.*—The object of the invention was to find a putty that would fasten leather, gutta-percha, and similar substances on metals, and make them durable. This object has been attained. The preparation is as follows: a quantity of common glue is warmed on the fire, to this is added some gum ammonia, the whole stirred up till reduced to one mass, when saltpetre acid is poured in and mixed with the rest. A trial was made of 112 lbs. of glue, 7 lbs. of saltpetre acid, and 7 lbs. of gum ammonia. The composition proved the best known among metal binders, because not susceptible to the action of oil."—(*Land Journal* and *Journal of Applied Chemistry.*)

"*Wasting of Coins.*—It is stated by an eminent English authority that the life of coins is much briefer now than before the introduction of steam for passenger travel. This is attributed to the almost constant attrition to which they are subjected by being carried about and the consequent passage of them from hand to hand. The authority we quote states that it takes on an average a hundred old shillings to make eighty new ones. This is a fearful waste, and as we expect some time to see gold and silver again a common medium of exchange in this country, it is of some importance to ascertain a remedy for the deterioration of coins. With copper and bronze coins it may be of no consequence, as they never bear intrinsically the value which they nominally possess, so that there is really no actual loss from wear. Gold and silver coins, however, are really worth their face or nominal value.

"The method of manufacturing coins is opposed to their longevity. The plain disk is placed between the dies, as soft as the most perfect annealing can make it. When minted, the recessed surface is hardened by compression, while the raised surfaces are left in a state very near that of their original softness. But these parts, unfortunately, are just those most exposed to attrition. The only remedy that suggests itself under these circumstances is a broad and projecting rim which, presenting less surface than the other figures, and being higher, would in a measure defend and protect them from rapid deterioration."—(*Sci. Amer.*)

Tempering Steel.—It is stated (*Ibid.*) that "small steel implements, after hardening, may be drawn to temper on a buff wheel."

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Guide for using Medical Batteries; (Being a Compendium from his larger work on Medical Electricity and Nervous Diseases:) Showing the most approved Apparatus, Methods and Rules for the Medical Employment of Electricity in the Treatment of Nervous Diseases. By ALFRED C. GARRATT, M.D., Fellow of the Massachusetts Medical Society, and Member of the American Medical Association. Philadelphia: Lindsay & Blakiston, 1867.

As its title clearly indicates, this is an introductory monogram to the medical uses of electricity, freely illustrated with drawings of the different apparatus employed, accompanied with directions for their application in the treatment of disease; it being, as its author states, "intended as a concise *practical guide* to the medical and surgical uses of electrical apparatus." It is one of those useful publications so much desired by practical men, and should be in the hands of every student interested in the subject of which it treats.

Diphtheria. A Prize Essay. By E. S. GAILLARD, M.D. Richmond, Va., 1867.

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These are valuable essays on subjects of great importance to the physician, but of little immediate interest to the dental specialist.

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ORIGINAL COMMUNICATIONS.

BLEACHING DISCOLORED TEETH.

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It is a somewhat remarkable and inexplicable fact that none of the text-books which have been presented to the profession, so far as my observation goes, pay even the compliment of a passing notice to the means whereby discolored teeth may be improved in appearance. Whether the subject was regarded as unimportant—the methods so well known as not to require description or comment—or the authors did not know of any other means of eradicating such difficulties other than by extracting the offending organs, is hard to say; and yet when recalling instances in which the beauty and symmetry of sets of teeth that truly rivaled pearls in their color, brilliancy, and perfection of structure and form, have been entirely marred by an unsightly blackened or discolored tooth, the importance of the subject becomes apparent, and it is not surprising that the presence of such teeth should be a constant source of mortification and annoyance to the patients, or that they should desire to be relieved in some way or other from the source of trouble. When all efforts to remove the discoloration has proved unavailing, a strongly developed feeling of pride of appearance has not unfrequently induced patients to insist upon extraction, and practitioners have been found willing to comply with the request, although in all other respects the teeth were good and useful organs.

The shades of color presented by such teeth vary greatly, and depend upon the cause producing the discoloration and length of time that it has existed; thus it may be of a rosy or even a scarlet hue when recent; or brown, greenish, or black when of long-continued duration. A fall, a blow, or exposure to thermal influences may do such violence to a tooth that the vessels of the pulp will become congested to an extent that rup-

ture of the blood corpuscles will take place, and the hæmotine or coloring matter of the blood uniting with the liquor sanguinis, being carried into the dentinal tubuli, gives to the tooth a rosy appearance, and in the case of very young persons, where the dentinal tubuli are very large, the color sometimes reaches a brighter red. The treatment indicated under such circumstances is to drill at once into the pulp cavity, so as to afford a convenient place of exit for the blood. In some cases the discoloration will disappear in a very short time after the removal of the pulp by syringing the pulp cavity with tepid water; in other instances the employment of additional agencies, which will be named hereafter, may be required.

Devitalization of the dental pulp may ensue from the causes referred to above, with little or no evidence of the fact until the attention of the patient or friends is arrested by a slightly darkened appearance of the tooth. It is in cases such as this that the acuteness of vision and judgment of the dentist are frequently put to the test, and it is important that he should be prepared to decide promptly, so as to afford the proper attention immediately, and prevent additional and permanent discoloration. In cases of doubt, the employment of a strong, clear, and steady light, falling directly upon the tooth, combined with the reflection from a good mouth mirror held back of it, will afford an opportunity to institute a comparison between the affected organ and the adjacent healthy ones, and readily decide the question. In other cases, the extreme dark discoloration tells the tale in a forcible manner. In the treatment of exposed pulps it is not an unusual thing, in the hands of careless practitioners, for the teeth treated to become discolored, and even with the greatest care on the part of the experienced, skillful, and pains-taking, some evidence of the loss of vitality will occasionally be made manifest by a slight change of color in teeth treated by them.

The coloring matter of the blood absorbed by the tubuli remaining there, changes to a dark or blackish hue, and imparts to the tooth the variety of shades already referred to, or the absorption of the oral secretions, mixed with foreign substances, in teeth where the pulp cavities are allowed to remain open for some time, may induce the same result. Too much care, indeed, cannot be exercised in protecting a tooth from such influences.

As in the case of the rosy tooth, the first indication when treating a dark discolored tooth, is to open into the pulp cavity, if not already exposed, with a drill; or remove the filling in a case where the pulp has been treated with the arsenical paste, and then syringe the cavity freely with water, so as to remove all decomposed or foreign substances; after this, the employment of one or the other of the following combinations of chlorine with soda, lime, or potash, will be found, as a general thing, efficacious in restoring a tooth to its natural color. The active agent in bring-

ing about this result, of course, is the chlorine, whose chief characteristic is the bleaching power it possesses; decomposing in a rapid and remarkable manner the most stable organic coloring principles, by combining with and removing the hydrogen present in the coloring matter. On account of this property it is largely used in the arts, particularly in bleaching linen and cotton goods prior to their employment in the manufacture of paper.

Labarraque's liquid, the Liquor Sodæ Chlorinatæ, U. S. Dispens., is one of the most reliable articles in bleaching discolored teeth, and much less objectionable than the other preparations, which will be named. When using it, a pledget of cotton of suitable size, to admit of an easy passage into the bulbous portion of the pulp cavity, should be saturated with the liquid and placed in the tooth, and allowed to remain there about thirty minutes or so; during this time the fluid permeating the dentinal tubuli comes in contact with the coloring matter and decomposes it. In teeth slightly discolored, a single application may suffice, while repeated applications will be demanded in cases where the discoloration is very great or long continued. Care should be exercised in making the application not to allow it to cause unnecessary annoyance by coming in contact with the tongue, as the taste is very disagreeable. This can be readily prevented by covering the pledget of cotton with a temporary stopping of wax and cotton.

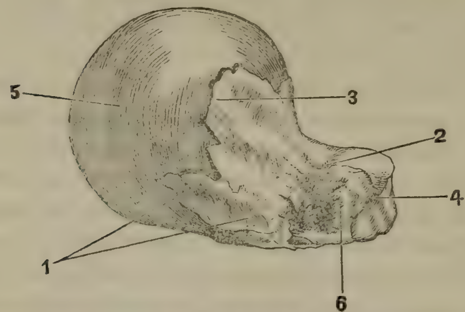
Chloride of Lime, or Calx Chlorinata, U. S. Disp., the bleaching powder of commerce, is sometimes employed by dental practitioners, and when used with care is a very valuable agent; but its exceedingly disagreeable odor, and its powerfully destructive action on organic structures, are objections which demand that it should be employed with the greatest caution, or it may do more harm than good. This article when fresh and well prepared is a soft, white powder, which attracts moisture from the atmosphere, and is soluble in about ten parts of water. In this connection it may be well to state that the presence of water is essential in securing the bleaching properties of chlorine, for the gas, in a state of perfect dryness, is incapable even of affecting litmus paper. It should be applied on a pledget of cotton in the same manner as the article first named.

Chlorate of Potash, Potassæ Chloras, Lond. Pharm., may be employed with advantage, but, like the chloride of lime, must be used with judgment and discretion; either of these articles, in the hands of ignorant or careless operators, may become a source of great discomfort to patients by exciting intense irritation and subsequent inflammation in the perodental membranes. The proper way to prevent this is to fill the cavity in the roots with cotton prior to making the application.

In the intervals between the application of the chlorinated preparations, the pulp cavities should be protected from external influences as much as possible by temporary but efficient stoppings.

ENCYSTED TUMOR OF THE ANTRUM.

BY HENRY S. CHASE, M.D., D.D.S., IOWA CITY, IA.



1, root of second bicuspid attached to alveolus; 2, neck of tooth and border of alveolus; 3, walls of antrum, palatal side; 4, centre of crown of tooth; 5, tumor; 6, tartar, covering the cavity of decay. The buccal aspect of the tooth was similar in appearance to the palatal surface which is seen in the engraving.

THE above engraving is a correct representation of a tooth extracted by me a few days since.

CASE.—An Irishwoman, about forty years old, came to have the right upper first molar extracted. I found her teeth generally in a bad condition; they were decayed and loose, and the gums congested. This particular tooth was decayed and very loose. On pressing it, the alveolus seemed to move with the tooth. Adjoining it in front was the root of the second bicuspid—the crown gone. As she was of that class who make no attempt to preserve their teeth, I extracted the molar without hesitation. She had told me that her "jaw" had ached for three or four months previous to this time. On applying the forceps, the beaks readily passed under the gums, without lancing, and the tooth came away with the application of very slight force, much to my surprise. But this surprise was not equal to my astonishment when I saw what I had brought away with the tooth, namely, a large quantity of alveolar substance, the bicuspid root, and a fibrous connective tissue tumor nearly an inch in diameter, attached to the tooth and inclosing two of the roots, namely, the posterior buccal and the palatine roots. As I was very busy at this time, I did not stop to examine the tumor further, but threw it into alcohol for future examination.

My patient fainted, and I found very alarming hæmorrhage taking place. Persulphate of iron and lint were used in large quantities before hæmorrhage ceased. The whole maxillary sinus was packed. I was now satisfied that the antrum had been filled with this tumor. When first seen, the latter was dark colored (from congestion, I think), quite as dark as a clot of venous blood.

After being in alcohol three days, the tumor was nearly white, and had shrunken to one-third its original size. On cutting it open, it was found filled with a solid structure. The consistence was that of tubercle, or pressed cheese curd; the color, light yellow, tinged with red in most parts. Under a microscope of 400 di. I can discover no perfect cells of any kind.

Before opening the walls of the tumor, large quantities of its contents had exuded, forming a porridge-like fluid, which settled at the bottom of the alcohol. This substance, under the microscope, also showed no entire cells, but had the same appearance as that which did *not* exude. None of the granular matter was as large as whole pus or blood cells.

The roots within the tumor are nearly free, and are covered with their pericementum (periosteum), which is thickened into a loose spongy mass on every portion of the roots, and at the base of the roots on the body of the tooth. The appearance of the roots are like those which have been involved in alveolar abscess. The walls of this tumor are not composed of detached dental periosteum. Since their contraction from the effects of alcohol, they are about one and a half millimetres in thickness. There are apparently two coats; the outer, fibrous like periosteum, and the inner is a mucous one, like the lining of the nasal cavity.

How was this tumor formed? Certainly not from the dental periosteum (pericementum). Were the coats of this tumor once the lining membranes of the antrum? I think not, for it does not look as though it had been detached from bone.

The PATHOLOGY I think is this: The tooth decayed to the pulp cavity, and the pulp, after repeated inflammations, died. Putrefaction of that organ took place, causing pericementitis. After awhile suppuration ensued, and the disease became chronic. The pericementum became thickened and spongy, as the *specimen* now shows. Continued irritation caused a proliferation of connective tissue corpuscles from the pericementum, resulting in the formation of the sack of the tumor.

Such tumors are rare in dental practice. It is the first I have seen in this relation in twenty-five years. They are not malignant growths; not inimical to life, though certainly to health and comfort. By *pressure* the walls of the antrum become thin, and necrosis sometimes takes place; by growth and pressure these tumors are dangerous. They are not liable to recur when once extirpated; the cells of which they are composed are not heterologous, like cancer cells, and will not, like the latter, circulate in the lymphatics and cause morbid growths in other parts beside the one originally affected.

SURGICAL DEPARTMENT OF THE PHILADELPHIA DENTAL COLLEGE.

Under the charge of James E. Garretson, M.D., D.D.S.

CLINIC REPORT.

BY H. L. GILMOUR, D.D.S.

ALTHOUGH the door of the above institution is now closed, and with it the session of '66 and '67, in which thirty gentlemen received each their degree of D.D.S., still we cling to the pleasant and instructive association of the many hours therein spent, and feel that, as now ourselves workers in the common field, it behooves each one not only to remember his *Alma Mater*, but to contribute as largely as possible to the advancement of the profession through such channels, that even the most distant may be reached and edified.

It is as the result of such feelings that I will endeavor to continue the clinical observations of Dr. Garretson, until all the cases that were presented before the class just closed have been reported.

DISCHARGE OF PUS FROM THE NARES.

CASE FIRST.—Here is a patient who suffers with a discharge of pus from the nose. The trouble is occasional, not continuous. It has existed off and on, as he tells us, for over a year. We first naturally examine the nares, as the inference would be, that from some local ulceration comes the discharge. In examining the various canals and cavities of the body, light and room to observe are the two essentials.

One of the best rhinoscopes I have ever found is composed of mid-day sunlight and the delicate white handle of the ordinary scalpel.

We place this patient with his face to the window, and with the knife-handle, introduced into the canal, I press aside one lateral boundary. I can now see very well into the nose. Practice this a little, and you will find that it answers ordinary purposes very satisfactorily.

Just inside the nares are seen two little teat-like elevations, one in either nostril; these are pathological appearances, and I presume will be found connected with the discharge. Looking at them closely, it is observable that each teat has an opening into it. We will pass a probe into these openings and see to where they will lead us. Notice that on either side the instrument is directed toward the mouth. I presume this is a case of alveolar abscess; let us raise the lip and see. The two central incisor teeth, you can observe, are very dark; this means that they contain devitalized pulp. There is now no doubt of the nature of the trouble for which we are consulted; it is double dental abscess. The history of the case I can read for you without any reminders from the patient. Preceding this discharge from the nostrils he had severe tooth-

ache. First, inflammation of the pulps; secondly, peridontitis. The teeth became very sore to the touch, and felt elongated. After a few days, three or six, more or less, he found sudden relief in the first appearance of this pus from his nostrils; the suppurated matter had found vent; the pressure ceased, and of course relief was experienced. An alveolar, or tooth abscess, is, as a general thing, a simple affair; the periodonteum becomes inflamed, and suppurates. The pus, accumulating about the root of the tooth, compels, for its accommodation, an absorption of the surrounding bone; egress is sought in the easiest way, and this is generally found on the vestibular face of the process, directly opposite the affected part. It is the abscess known as parulis or gum-boil. Cases occur, however, as in the one before us, where the pus does not take this seemingly natural course. Here, both abscesses have opened into the nose. I have generally found, however, that there are very good reasons why the anomalous courses are pursued. In antral abscesses, for example, or rather in alveolar abscesses, discharging into this cavity, it will always be found that in such direction was encountered the least resistance.

In specimens upon the table, you can see a number of maxillæ where the roots of the molar teeth are so long as to pass entirely through the antral floor. We certainly could not expect, under such circumstances, that the discharge would occur anywhere else than into the sinus. In the case before us, the septum of bone intervening between the roots of the tooth and the nares is, I am positively certain, less in thickness than the lateral alveolar boundaries; hence it is quite natural that the discharge should have here taken place.

I have known an abscess from a periodentally diseased tooth discharge into the orbit. In this case, the only one I ever met, the tooth was encysted, and lay between the antrum and nasal process. Alveolar abscesses not unfrequently discharge upon the cheek. In these instances, however, the treatment has generally been of a domestic nature. I have treated them upon the neck, upon the temporal region, at the apex of the chin, upon the intermaxillary suture, and in other positions which I do not just now recall.

To cure the patient of his discharge we must, of course, cure the teeth. The easiest, most speedy, and certain way to do this, would be to extract them; I will advise, however, first the trial of another plan. I will send him to the dental department, and holes shall be drilled through the palatine faces of each tooth into the pulp cavities; through the outlets thus made, the pus will discharge itself, the sinuses leading into the nares will close up, and while thus at once we will relieve him of the nasal trouble, it is not at all improbable that by the occasional syringing of the abscesses through the canals of the teeth, with dilute tincture of iodine, that we may as well save for him the organs, which, in such a position, influence his personal appearance.

CASE SECOND.—Amputation of the Uvula. The uvula, as we are to remember, is composed of two little muscles, inclosed in a loose bag of mucous membrane; the muscles being attached to every part of the circumference of the bag through the interposition of cellular tissue.

Amputation of this organ is not unfrequently called for an account of its elongation or œdematous enlargement. When elongated and resting upon the tongue, it produces, by the irritation of its presence, a disagreeable or hacking cough, and which, not relieved, might well enough result in more than functional trouble of the lungs.

Elongation of the uvula is of threefold character. It may depend on simple relaxation of the enveloping mucous bag; upon atony of the contained muscles; or on a general hypertrophy of the full substances of the organ. In the two former cases its speedy contraction may often be compelled by the application of astringents. In the latter, if not associated with carcinoma, the sorbefacients are indicated. Amputation is, however, by far the easiest method of cure.

Sometimes, and most suddenly, this organ will swell out like the ambitious frog. It will fall into the chink of the glottis, and if not speedily collapsed, would destroy life. In these cases the enlargement depends on an exudation of serum into the cellular tissue. Application of the tincture of iodine is highly recommended by many persons in these cases, but if I myself were the sufferer, I would not like to feel that there was not a more reliable means to lean upon. Amputation, under these circumstances, is a certain relief, and should always be performed.

The patient before us has an elongated uvula. I propose to amputate it, that is to say, I propose to take off just so much as renders it too long. The operation is an exceedingly simple one. I have performed it upon my own uvula standing before a mirror. Here is a pair of Liston's forceps, a pair of curved scissors, and a tongue depressor. These are the instruments required. With the depressor I force down the tongue and hold it; with the forceps, which, as you see, close with a spring and are tooth pointed, I catch the top of the organ; now it is completely under my command. I pull it gently forward, and you see I have it directly in the centre of the oral cavity; my assistant now takes the tongue depressor, and with the relieved hand I take up the scissors and clip off the organ. Here, in the grasp of the forceps, is the piece. We will direct the patient to gargle his throat with a decoction of quercus alba, and it will be well, if for a month to come, he takes daily, three or four times, a teaspoonful of the ferrated elixir of cinchona.

CASE THIRD.—Epulo-erectile Tumor of Upper Maxilla.

Miss Mary ——, 13 years of age; bilio-sanguine temperament; American.

The term epulis is a very bad and confusing one, and I think should never be used. It has none other than an anatomical signification, and simply means, "upon the gum." *Epi*, upon; *oylon*, the gum.

The tumors of the mouth, that are described under the head of epulis, are as many and diversified as the authors who have written upon the subject, and no one can read them without soon perceiving an existing confusion. In this clinic, we call all tumors situated upon the gums, of whatever nature, epulic; but each has its special classification, as implied in its pathology. Thus, here is a spongy vascular tumor in the mouth of this patient; in pathological character, it is erectile—that is, it is composed of a congeries of vessels, intermixed and held together by cellular tissue; so we say it is an erectile tumor, but being upon the gum, it is epulic. But if I call it simply an epulis, I do not tell you anything of its character; I simply indicate a tumor situated upon the gum. According to a nomenclature of which I have before spoken to you, I call this tumor an epulo-erectile tumor; if it was fibroid, I would then call it epulo-fibroid; if it was cartilaginous, I would call it an epulo-cartilaginous tumor, and so on. Thus it must be evident to you that the subject is disrobed of all its confusion. You will remember that *epi-oylon* is only properly convertible into an adjective, and not into a noun.

The tumor before us is now of some two years' standing. It has been treated, as we are informed, by the ligature, by caustics, and in various other ways—in all unsuccessfully. I have seen so many of this kind of tumor, that I know the underlying bone to be implicated. I pass this sharp-pointed probe through the mass, and as I was sure I would, I find the bone like honey-comb. It is thus made evident, that ligation of the soft parts could not meet the indications, and caustics are about as useless. Indeed, such applications only aggravate these tumors. This growth, as you see, is about the size of a hickory-nut; when I compress it between the fingers, I markedly reduce its volume. The patient could tell you, if questioned, that it varies in size with the quiet or excitement of the circulation. It does so because it is a vascular body.

Is it at all cancerous in nature? Well, whether it is so or not, if it is not very completely removed, it will progress until it destroys the patient; and if it is thoroughly extirpated, it will not be likely to come back.

To cure this patient, I will now perfectly circumscribe the diseased part, cutting with a scalpel through the healthy soft parts, directly down to the bone. The next step will be to remove the diseased osseous structure, and a portion of that unaffected. For this purpose I have two pairs of bone-forceps; one pair cuts like ordinary scissors. With these I now follow the vertical cuts on either side of the tumor, which I have just made with the knife, making the blades meet through the bone. The second pair cuts horizontally, as you see, and with these I connect, above the tumor, the cuts vertically made. Here is the diseased mass. You see how easy of performance is the operation, and how quickly it can be accomplished.

What is to be done with the wound? For the present, nothing. If everything goes on right, we will see it in a few days covered with fine florid granulations, and a process of repair will go on without any help from us. If, on the contrary, an action too high or too low sets in, we must treat it as indicated by the circumstances. Generally, I think, it will be found that a tonic, rather than any atonic, treatment will be demanded.

Case Fourth.—Appearance after an Operation on the Upper Jaw.

This lady, one of my private patients, is kind enough to come before us for our instruction. In looking at her face, as she now appears, the symmetry, even to her teeth, is complete. She will allow me to remove from her mouth an artificial denture, and you remark how great a deformity is the result. In looking into the mouth, you will see that she has lost fully one-half the upper jaw of the right side. This I was compelled to remove, some time back, for the cure of a growth similar to that upon which I have just operated. The section extends from the alveolus of the right incisor tooth back to the tuberosity, and as high up as the infra-orbital foramen. In one month the case was well enough for the artificial substitute she employs, and which, as you see, differs from an ordinary set of teeth only in having the plate portion made to occupy the irregularity produced by the operation. The little girl can have any resulting deformity corrected in the same manner.

The compensatory part of our art is one deserving from you a close attention. Some of you, I am happy to say, have already given to me the most satisfactory evidence of ingenuity in this direction. You have been of great service in helping to carry happily through some of the clinic cases.

Note.—In reporting for this journal the clinics of Dr. Garretson, I shall take from my note-book, without regard to date, such cases as I think will most interest its readers. At each clinic there is one or more oral cases, the remainder being general surgical affections. I am preparing each week full reports for the *Medical and Surgical Reporter*, which the interested reader can consult.—H. L. G.

CASES IN PRACTICE.

BY ABIEL BOWEN, MEDINA, N. Y.

In the February number of the Dental Cosmos, I read a "physiological law" laid down by Dr. Chase, of Iowa, to wit: "that absorption of the roots of temporary teeth takes place in the ratio of the advancement of the permanent," etc.

Now, that may hold good as a rule for aught that I know, and if so, the cases I give below only confirm the old adage that there is no general rule without its exception.

Case 1.—Miss F., age twenty-two years, who retains the left supe-

rior canine milk tooth as firmly as the second canine of the same side, which is just posterior to and adjoining it. Her upper teeth all regular, with just room enough.

Case 2.—Mrs. C., age twenty-one years. She retains the left inferior canine milk, with canine of second set behind and approximating. She had the most regular set of teeth that I ever saw that were natural, with the above exception. Many will say "there is plenty of time yet for those teeth to be shed."

In the second case that may be true, but I hardly think it will be with the first, as it was in the summer of 1857 that it came under my notice; then, in 1865, I saw her again, and she still retained the milk canine as at first. The second case I saw only last October.

In my book, from which the above cases were taken, I have a case that was entirely new to me, and send it in hopes to gain light on that point. Last November, Mr. Swaine, of Iowa, came to consult me in regard to facial neuralgia. It has troubled him for a long term of years, occupying the right side of face, but more particularly the inferior maxilla. He has consulted numerous physicians, and lost all his teeth on that side back of canine, and all to no purpose. No doubt I should have been no wiser than the rest if he had not shown me a slight enlargement, which was only perceptible to the closest scrutiny. Said enlargement proved to be an aneurism of the sub-mental artery. Doubting my own judgment, I called in a surgeon and asked his opinion. It was extremely sensitive to the touch, and gave him severe pain; but, upon applying pressure at the point where the artery passed over the jaw, all pain ceased. We then determined to apply a compress, which was done, and the patient dismissed with instructions to report in a few days.

THE MAGNESIUM LIGHT.

BY ALBERT R. LEEDS, A.M.,

PROFESSOR OF CHEMISTY IN THE PHILADELPHIA DENTAL COLLEGE.

It appears to me that there is no fact in connection with the civilization of the present day of greater interest than the rapidity with which inventions, which seem at first of value to science only, are made available in the arts. This observation applies with especial force to the employment of the metal, Magnesium, for purposes of illumination. Three years have scarcely elapsed since small pieces of fine magnesium wire, purchased at a very high price, were exhibited as a great curiosity, and their burning with a dazzling light excited the greatest possible astonishment. When burned in the form of wire, however, the globule of fused metal at the end of the ignited wire was apt to drop off, and the light to become in this way extinguished. This trouble was obviated by flattening the wire into ribbon, and burning two or more ribbons in conjunction, so that when one ribbon ceased to burn it might be relit by the other.

The next great object to be attained in the employment of magnesium as a source of illumination, was the invention of some apparatus by which the burning ribbons might be paid out at the precise rate of combustion. Very many expedients were resorted to, and much ingenuity was displayed in the regulation of the speed, the arrangement of the ribbons, removing ash, securing a draft, and sweeping the smoke away from the burning metal; every fresh device was followed by a modification, and a skilled mechanician was kept by the American Magnesium Company constantly employed during the last two years in perfecting the lamp designed for burning magnesium. It would occupy too much time to follow the history of these improvements, and I shall merely describe in a few words the excellent lamp which has been furnished me by the American Magnesium Company of Boston.

The outer case of the lamp is made of japanned tin; the chimney and reels, of brass; dimensions as follows:

Length of base, 6 inches; width of base, $4\frac{1}{4}$ inches; height to top of chimney, 13 inches; height to top of reels, $11\frac{1}{2}$ inches; height to centre of flame, $5\frac{1}{2}$ inches.

It will be seen from the measurements above given that the lamp is of a convenient size and form, and can be placed on a small bracket, stand, or arranged in almost any position required. The rate at which the two ribbons is fed is regulated by clock-work, and the speed at which this clock-work moves is determined by two fans, capable of being placed at any angle to the direction of motion, and inserted upon opposite sides of an axle connected with the works. This axle is grasped by little pincers when the machinery is at rest. It is allowed to run, when a key, made in the form of a wedge, is inserted, and the blades of the pincers forced apart from the axle. The two strands of ribbon are coiled upon reels, which are placed on the top of the lamp, and pass from the reels through slits in the chimney down to a pair of friction rollers; caught by these, the ribbons are made to move downward and pass in front of an oval opening in the outer case of the lamp. Here they are burnt. The draft of air occasioned by the burning passes from without into the opening, and thus the dense clouds of the magnesia smoke, which are formed by the combustion of the magnesium, are swept away from the opening, and the rays are permitted to issue unobstructed. A snake-like tube of muslin fastened over a spiral of cane, and which may be easily compressed into a length of eight inches, or pulled out to a length of twenty feet, connects the lamp-chimney with any neighboring flue.

Such a lamp is well adapted to afford a most brilliant illumination. The following simple experiment will give an idea of its excellence in this direction. I placed a tall cylinder of wood in front of a screen, and separated from it by a distance of two feet. A good stearine candle placed six feet from the cylinder cast a strong well-defined shadow upon the screen. When the magnesium light, which had been set at a dis-

tance of ten feet from the cylinder and a little to one side of the candle, was lit, the shadow of the latter was obliterated, and the screen appeared equally illuminated in all parts.

This lamp might be applied to the lighting of mines, tunnels, railways, depots, etc. It gives a very *white* light, a candle-flame, gas-burner, and even the lime light appear yellow in comparison. To those engaged in the manufacture or sale of colored fabrics, the dyer or silk-mercer for example, this property of the light might prove of great value. It answers as well in many respects as the lime light for the exhibition of paintings, diagrams, and photographs in the magic lantern. Groups of statuary are shown to particular advantage with this light, and stand out upon the screen with a very beautiful and delicate illumination. Such a lamp may be made to take the place of the reflector in a microscope, and the pictures of the magnified objects obtained in this way may be received upon the sensitive film of a photographic plate and rendered permanent. One of the first uses, indeed, to which magnesium was applied, was in the taking of photographs. Not, of course, when the light of the sun was obtainable, but in the interiors of rooms, caves, monuments, etc. The successful attempts which were made by Prof. Piazzi Smyth to photograph the granite coffer in the king's chamber of the great Egyptian pyramid, in order that the much-disputed question as to the capacity of the English quarter might be set at rest, has acquired universal celebrity. Subsequently, Mr. Whaldeck procured beautiful pictures of the giant's coffin and other localities in the Mammoth Cave. It still remains for some adventurous photographer to descend beneath the surface of the sea, and apply the magnesium light to the making of pictures of the exquisite and novel forms of marine vegetation, and the silent groves and gardens which are hidden on the subaqueous shores.

Precious photographs of interiors, when scenes are enacted in public meetings worthy of remembrance, and great men are for the time being assembled together, may readily be obtained by the magnesium light. One of the earliest attempts in this direction was made in a lecture delivered soon after the introduction of magnesium at the Franklin Institute.

But my especial object, in this communication to the DENTAL COSMOS, was to call the attention of the medical and dental professions to the uses to which they might apply the magnesium light in their respective specialties. I would respectfully suggest the employment of the magnesium light in laryngoscopic examinations. By the use of an ordinary Bull's-eye condenser and a mirror placed at an angle of forty-five degrees to the beam of light from the magnesium lamp, the throat might be illuminated with the greatest distinctness. It need not be feared that the light would be blinding from its brilliancy. A distinction must be drawn between the quantity and the intensity of light. The lime light is of great intensity, but of small quantity, the rays proceeding from a very small

disk of lime intensely heated beneath the pin-like jet of the oxyhydrogen blowpipe. The same remark is still more emphatically true of the electric light. When the eye is turned upon such a point of intense light, a coresponding image is formed upon one point of the retina, and the great excitement of the nerve of vision situated at that spot produces pain. But the case is different with the magnesium light. Here we have an inch or more of burning metal, and the image is spread over a proportionate part of the retina. The brilliancy has never caused me any discomfort, and I have noticed that when the rays from the magnesium lamp were directed into the eyes of an audience at a lecture, the people present appeared pleased at their soft radiance, and kept their gaze steadfastly upon the lamp, while, on the other hand, all eyes were averted and foreheads were contracted when the lime light was turned upon them.

In conclusion, I should like to draw the attention of dental practitioners to the advantages which they might derive from a source of illumination which is capable of taking the place of the solar beam. At a meeting of the Odontographic Society, a member examined my mouth while it was lit up by the light from the magnesium lamp. He stated that he could see every portion of the mouth distinctly; that he could examine critically every tooth, and could see clearly to fill any cavity which might exist in the dental surfaces.

It would be possible with this light, therefore, to operate upon the teeth at night and during cloudy winter seasons, without injury to the eyes of the operator or discomfort to the patient. The price of the magnesium wire at present is $3 25 per oz., which would make the cost of consumption in a magnesium lamp about $1 50 per hour. This great cost would appear at first sight a great obstacle to its employment; but it should be remembered that the expense has been decreasing continually, and that it would be very much diminished by the general employment of the magnesium for illumination. Civilization demands "more light," and those who are interested in the furtherance of science and the advancement of art, will hail the extensive use of this exquisite light as a step in the onward direction.

THE ALUMINUM BASE.

BY JAMES B. BEAN, D.D.S.

An article appeared in the Dental Cosmos for February entitled "Maryland Association of Dentists," in which mention was made of my experiments with the new metal, aluminum, with a view to its application in dentistry. This was without my knowledge, as I was not aware the Society had authorized any publication of its proceedings. In consequence, however, I have received a number of inquiries concerning my progress in perfecting the adaptation of this metal for bases of artificial

teeth, and therefore ask the privilege of a few words on the subject in your journal.

Although gold and platinum had been so much improved in their adaptation as a base for artificial teeth, as to scarcely expect a rival up to the advent of *cheoplasty*, yet there was always a yearning and looking after something that would be *stronger*, and at the same time *lighter* —a better fit, and at the same time more easily gotten into shape—and moreover that would be cheaper, less liable to accident, and more easily repaired when injured. Gold had enjoyed so many years of undisputed supremacy, particularly in America, that there had been until within the last few years a universal prejudice in favor of this bright yellow metal for all kinds of artificial dentures. Platinum, as used in the beautiful continuous gum work of Dr. Allen, was the first to dispute the sway of its royal predecessor, and well has it maintained its place in the province it occupies; but it is too heavy to be comfortably sustained as an upper plate, being twice as heavy as silver, and nearly *ten* times as heavy as aluminum. On this account, also, a plate composed of platinum is much more liable to accident from falling even from a moderate height.

"Cheoplastic" was the next metal that claimed admission into the mouths of our unfortunate patients, and even *tried* to uphold a claim to *royalty* among the family of metals; but its *baseness* was too observable even to the common eye to allow its admission to distinguished favor. Just as this young aspirant—revived from the old Hall process—was first brought to the attention of the profession, as it began to dispense with its useless appendages of antimony, bismuth, and nickel, and to take the *argentine* admixture alone for strengthening its sinews, it encountered a formidable rival—an all-powerful member of the vegetable kingdom, reeking mid the fumes of *sulphur* and rearing its *vermilion* head so high above the leaden crest of cheoplasty, that this was soon trampled under foot and forgotten. Emboldened by its triumphs over iron, ivory, bone, and shell, in the manufacturing world, and urged on by a moneyed monopoly, it at once asserted its claims to extensive adoption in the dental laboratory as a base for artificial teeth; and in the space of eight or ten years has almost entirely eradicated that old popular prejudice in favor of *gold*. But "vaulting ambition o'erleaps itself," and this usurper has grown to be offensive to delicate nostrils, aside from its smell of sulphur, and we begin to see many other of its serious defects.

Vulcanite has had its day, and even now the arbitrary, offensive manner in which the profession are being taxed by the owners of certain doubtful *patents*, is driving many of the best operators to abandon it and go back to gold and platinum. But, during this vulcanite reign of some eight or ten years, the way has been paved for another great improvement in mechanical dentistry; and in the mean time science, ever showering her blessings on humanity, has brought up for us a young cion of the royal family of *noble metals*, that is destined ere long to supersede the pre-

sumptuous vulcanite in the dental laboratory and in other departments of art and manufactures. We already see laces and jewelry made of it, and where the black vulcanite once glistened in the lily fingers of a fair lady at the opera, her glass, now banded with the light lustrous *aluminum*, gleams with silvery brightness from the same lily fingers—doesn't soil her kids, nor smell of sulphur and galvanized brass.

Aluminum, *par excellence*, is *the* metal most perfectly adapted as a base for artificial teeth, among all of that numerous class of bodies that have been discovered up to the present time. In its pure state it has all the lustre, beauty, and whiteness of silver, and when properly cast has a strength and rigidity far superior to gold or platinum of the same condition and thickness. This property is improved in as great a degree by the slight admixture of other metals, as gold is by the admixture of two or three *carats* of copper or silver. Yet aluminum will not bear so large an admixture as one *carat* of even gold or silver, and one carat of copper would render it entirely unfit for dental purposes. An alloy with zinc lowers its melting point, increases its specific gravity, and allows the compound to be *cast* in moulds as other metals; but this alloy is entirely unfitted for a base for artificial teeth. Aluminum in its pure state, cast, is from $2\frac{1}{4}$ to $2\frac{1}{2}$ times the weight of an equal bulk of water, while platinum is nearly 22 times as heavy as water. This extreme lightness of aluminum renders it incapable of being cast into a fine mould in the ordinary way of casting the heavier metals. Therefore other means must be employed for producing in it the minute details of a fine casting. This metal is fusible at a low red heat, first assuming a pasty condition, then at a cherry red it is quite fluid, and the melted mass now appears as so much *froth*, yet when solid it is almost as strong and rigid as wrought-iron. It is susceptible of a fine polish, and under the burnisher assumes a brilliancy equal to the finest silver, and much more lasting. Strong nitric and sulphuric acids have no perceptible action on aluminum at common temperatures, and boiling nitric acid dissolves it with less energy than aqua regia does gold. Hydrochloric acid attacks it more readily, and at ordinary temperatures, evolving hydrogen gas. Concentrated acetic acid exposed to the open air attacks it slowly after one or two days, but common vinegar has no perceptible effect. Sulphur, and sulphuretted hydrogen, which attack silver and even 18 carat gold with such energy, have no effect whatever on aluminum.

Now all of these are most valuable properties in a material for artificial dentures, and perhaps all we could wish in addition would be that its point of fusion might be as low as that of tin; but we could never hope for this in a metal of sufficient strength and rigidity. For instance, sodium, a metal lighter than water, is quite liquid at 194° F., but at ordinary temperatures is as soft as wax. Thence on up the scale through lead, tin, zinc, etc., to *iron* and *platinum*, among the strongest and most infusible of the metals; and iridium, a metal harder than steel, is said to

be one of the most refractory substances known, resisting without fusion the most powerful heat of the oxyhydrogen blowpipe. Another objectionable property is the great expansibility of aluminum by heat, this being about $\frac{1}{100}$ of its own length in passing from 32° to 650° or 700° F. Yet this may even prove to be a most *valuable property.*

My apparatus for casting the metal was completed in September, 1866, and the piece exhibited to the DENTAL SOCIETY OF THE STATE OF MARYLAND* on 30th of November last, was among my first attempts, but since that time I have made many valuable improvements, and the principles of the process as now developed are all that can be desired, and only remain to be perfected in their more minute details. The discovery of the *process itself* has cost much study and research, together with many expensive and laborious experiments, developing several *patentable* principles, yet I shall not patent any portion of it, nor suffer it to be done by any one (unless a prior inventor) if I can prevent it, and I ask the profession to sustain me. We should have no patent processes in dentistry; let each one give liberally what he has to give and acknowledge generously what he receives. The apparatus used, any one will grant, should be covered by a patent, as an article of manufacture, as it will undoubtedly be used by all artificers who wish to cast aluminum in fine moulds.

I propose in as short a time as possible to publish a book of instructions, giving all the minute details of the process, and will have the apparatus manufactured for all who wish to use it.

In the hands of the more skillful portion of the profession the *aluminum work* will repay the expenditure of skillful manipulations more than any other. It will bring a price equal to gold work, and will be stronger and more durable than anything that has yet been used as an artificial denture. It can be made lighter, and at the same time stronger than rubber work, and will be more easily repaired than any other. The fit can be made nearer absolute perfection than with vulcanite, and the blocks and single gum teeth used in that work are admirably adapted to aluminum work, with but slight alterations, and the whole piece can be kept more cleanly and sweeter in the mouth than vulcanite ever can be. It has no more taste than porcelain, and plates worn in the mouth for weeks without cleaning present no change whatever.

Some of the most eminent dentists who have seen the results already accomplished, pronounce it "*the great desideratum* attained at last," and one who is known to the whole fraternity for his ripened experience and sound judgment, has said, "*this improvement promises more than anything that has been offered to the profession within my recollection.*"

We have more than a substitute for the odious vulcanite, and I hope the profession will test its merits at once, and encourage its introduction.

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* See DENTAL COSMOS, February, 1867, p. 376.

ABSORPTION OF DENTINE—PHYSIOLOGICAL DISINTEGRATION OF TISSUE.

BY HENRY S. CHASE, M.D., IOWA CITY.

The old theories in regard to dentification or calcification of the teeth are being one by one exploded. That which ascribes permanence (unchangeableness) to the dental tissues after the conclusion of dentification must by this time be considered by the dental profession an error. I have just used the word *calcification* as synonymous with *dentification*, but I consider the word misapplied when speaking of the physiological hardening of the dental tissues. Calcification is a process whereby lime is deposited in any tissue, and the latter thereby hardened. It is found without either dental or bone corpuscles; in the heart, arteries, lungs, brain, etc. Calcification is almost always a pathological process, and calcified tissue a heterologous formation.

But to return from this digression. I have many times in my professional life seen instances which clearly proved to me that not only are the lime salts absorbed from dentine, but that the dentinal tissue itself (dentine corpuscles, dentine tubes) is absorbed so as to leave a *cavity* where before was sound dentine. And this article is written to-day because I have to-day had an example of this kind.

Case.—Mrs. J., age thirty, January 27, 1866, wished the left under first molar plugged on the anterior approximal surface. Had never ached. I excavated and plugged without unusual pain. The cavity was large, but the pulp was *not exposed.* I am sure of that fact. I placed a thin layer of gutta-percha at the bottom of the cavity (as I frequently do when the pulp is nearly exposed) for the plug to rest upon. This tooth remained perfectly quiet and comfortable until two days ago. Has ached two nights. To-day I removed the plug carefully. The dentine has exalted sensibility. I was careful not to *cut* any dentine, for I suspected the state of things which was realized, namely, PULP EXPOSURE. In removing the plug, pressure upon the pulp caused it to bleed. I shall devitalize and replug.

When such physiological (pathological ?) changes can take place in the teeth, what folly it is for dentists to *warrant* their operations.

PROCEEDINGS OF DENTAL SOCIETIES.

BALTIMORE COLLEGE OF DENTAL SURGERY.

The twenty-seventh annual commencement of the Baltimore College of Dental Surgery was held at the Concordia Building, Baltimore, February 28th, 1867.

The valedictory was delivered by Prof. Russell Murdoch.

The number of matriculants for the session was sixty-eight.

The degree of D.D.S. was conferred by the Dean of the Faculty, Prof. F. J. S. Gorgas, upon the following gentlemen:

NAME.	RESIDENCE.
Hugh Wilson Arthur	Maryland.
Warner Julian Bailey	Mississippi.
John Robert Barr	Alabama.
Thomas Ligget Beckenbaugh	Maryland.
J. Robson Bromwell	Maryland.
Walter Bruce	Virginia.
Andrew Simon Cutler	Indiana.
Augustus Boyd Doremus	Louisiana.
Joshua Stevenson Dorsey	Maryland.
John Francis Ruter Dufour	District of Columbia.
Joseph Root England	Maryland.
John d'Oyley Evans	France.
William Farmer	Virginia.
James Taliaferro Grant	Tennessee.
Silon Homer Henkel	Virginia.
James Hogg	Maryland.
B. Rush Jennings	Maryland.
Henry R. Johnson	Virginia.
Harry Galbraith Leas	Pennsylvania.
Algernon Mosely Lee, M.D.	North Carolina.
Alfred Fitzgerald Malone	Florida.
George William Massamore	Maryland.
Isaac Carrington Morton	Virginia.
James William Miller	Virginia.
Charles Norwood	Maryland.
Robert Lyon Seale, M.D.	Alabama.
Isaiah Simpson	South Carolina.
Ezekiel Cooper Stockton	Pennsylvania.
George M. Swormstedt	Indiana.
Marion Elisha Tarvin	Alabama.
John Charles Uhler	Maryland.

OHIO COLLEGE OF DENTAL SURGERY.

The twenty-first annual commencement of the Ohio College of Dental Surgery was held in the hall of the College Building, College Street, Cincinnati, March 4, 1867.

The valedictory was delivered by Prof. C. W. Spalding, of St. Louis.

The number of matriculants for the session was thirty-three.

The degree of D.D.S. was conferred on the following gentlemen by Prof. James Taylor, President of the Board of Trustees:

C. W. Stanley, F. Peabody, H. L. Ambler, B. B. Eaton, W. A. Graham, R. J. Irelan, J. F. McGinnis, G. W. Field, J. F. Child, P. T. Clark, R. F. Ludwig, J. Ropp.

PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

The annual commencement of the Pennsylvania College of Dental Surgery was held at the Musical Fund Hall, Philadelphia, at 8 P.M., Friday, March 1st, 1867.

The valedictory was delivered by T. L. Buckingham, D.D.S., Professor of Chemistry and Metallurgy.

The number of matriculants for the session was one hundred.

The degree of D.D.S. was conferred on the following gentlemen by W. W. Fouché, D.D.S.:

Name.	Residence.	Title of Thesis.
Stephen Armos,	Cuba,	Dental Caries and its Treatment.
John Aspinwall, Jr.,	Massachusetts,	The Dental Tissues.
Edward M. Beesley,	New Jersey,	Mounting Teeth on Rubber.
Charles Bulkley,	Pennsylvania,	Mechanical Dentistry.
John N. Crouse,	Illinois,	Filling Teeth after the Pulp is Exposed.
Charles H. Darby,	Missouri,	Hysteria.
Frank Darby,	New York,	Odontalgia.
Squire C. Dayan,	"	Diseases of the Dental Pulp and Periosteum.
James W. Gurley,	Oregon,	Treatment of Exposed Pulps.
Robert Huey,	Pennsylvania,	Inflammation.
James Lewis,	Vermont,	The Ext'n of Teeth as they pertain to Irregularities.
David R. Martin,	Pennsylvania,	Caries of the Teeth.
Mariano Martorell,	Porto Rico,	Caries of the Teeth.
John Q. McDavid,	South Carolina,	Extraction of Teeth.
Henry W. Moore,	Pennsylvania,	Combustion.
Gonzalo Orne,	Cuba,	Mechanical Dentistry.
Casimiro Portillo,	Cuba,	Inflammation.
George L. Rauch,	Pennsylvania,	Caries of the Teeth.
John S. Smith,	"	Treatment and Filling of Pulp Cavities.
James A. Sheldon,	New York,	Mechanical Dentistry.
Clinton W. Strang,	"	Sulphuric Ether and Chloroform.
James Taylor,	England,	Sympathetic Affections of the Teeth.
George R. Thomas,	Pennsylvania,	Preservation of the Teeth.
Francisco Vega,	Porto Rico,	Rubber *vs.* Metal.
H. Meredith White, M.D.,	Pennsylvania,	On the Growth of the Alveoli.
Joseph F. Winslow,	New York,	Antrum Highmorianum.

Graduates who have been Practicing since 1852.

G. C. Brown	New Jersey.	W. B. Hurd	New York.
J. F. Leaming	"	T. Burgh	"
D. R. Greenlee	Pennsylvania.	S. Hassell	"
J. H. Githens	"	A. L. Northrop	"
Spencer Roberts	"	Enos G. Ray	"
Amos Wirt	"	T. H. Musgrove	Maryland.
A. R. Robbins	"	W. W. Russell	Massachusetts.
Benjamin Wood	New York.	J. A. Salmon	"
C. A. Marvin	"	E. G. Leach	"
W. C. Parks	"	D. S. Dickerman	"
G. H. Perine	"	Chester Heath	New Hampshire.
C. E. Francis	"		

PHILADELPHIA DENTAL COLLEGE.

The fourth annual commencement of the Philadelphia Dental College was held at the Musical Fund Hall, Philadelphia, at 4 P.M., Friday March 1st, 1867.

The valedictory was delivered by Prof. Thomas Wardle.

The number of students in attendance upon the lectures during the session was seventy.

The degree of D.D.S. was conferred on the following gentlemen by the President, Rev. Richard Newton, D.D.:

Name.	Residence.	Title of Thesis.
Julian J. Anderson,	Massachusetts,	Artificial Dentures.
Stephen T. Beale, Jr.,	Pennsylvania,	Artificial Dentures.
James E. Blanchard,	Louisiana,	Circulation.
Frederick K. Crosby,	Connecticut,	Antrum Highmorianum.
Charles M. Curtis,	Pennsylvania,	Blood and its Circulation.
Roger Cutlar,	North Carolina,	Reflex Action.
Charles V. Du Bouchet,	Pennsylvania,	Digestion and its Organs.
George P. Franklin,	"	Filling Teeth.
Henry L. Gilmour,	Ireland,	Circulation of the Blood.
Edward Goertz,	Germany,	Digestion.
Daniel G. Harkins,	Massachusetts,	Filling teeth.
William C. Head,	Pennsylvania,	Organs of Digestion.
Arthur Holbrook,	Wisconsin,	Filling Pulp Cavities and Canals.
William H. Howard,	Pennsylvania,	Development of Human Teeth.
Frank A. Hunter,	New York,	Continuous Gum-work.
John G. James,	North Carolina,	Artificial Teeth.
M. Lukens Long,	Pennsylvania,	Temporary Artificial Dentures.
Andrew F. McAvenney,	New Brunswick,	The Fifth Pair of Nerves.
Louis P. Meredith,	Ohio,	Food and Digestion.
Edward D. Moore,	Ohio,	The Advancement of Dentistry.
George B. Morris,	West Virginia,	The Extraction of Teeth.
George S. Nyce,	Pennsylvania,	Extracting Teeth.
John J. Pitts,	New York,	The Blood and its Circulation.
John Powers,	Maine,	Cell Development.
Henry A. Robinson,	Maine,	Taking Plaster Impressions.
David D. Smith,	Massachusetts,	Glands of the Oral Cavity.
Leopold M. Townsley,	Missouri,	Histology of the Dental Tissues.
Karl R. Walther,	Germany,	Inflammation.
Marshall H. Webb,	Pennsylvania,	The Dental Tissues.
Otis C. White,	Massachusetts,	The Mallet, Wedge, and Chisel.

NEW YORK COLLEGE OF DENTISTRY.

The first annual commencement of the New York College of Dentistry was held at Steinway Hall, New York, March 6th, 1867.

The valedictory was delivered by Dr. W. W. Allport, of Chicago.

The number of students for the session was thirty.

The degree of D.D.S. was conferred upon the following gentlemen by the President, Eleazar Parmly, M.D., D.D.S.:

C. D. Allen, W. C. Horne, I. W. Lyon, of New York; J. F. P. Hodgson, of Ithaca, N. Y.; R. W. Browne, of Connecticut; G. Bernard, of Washington Territory; W. D. Tucker, of Tennessee; W. Dutch, of California; C. F. Meyer, of Germany.

THE AMERICAN DENTAL CONVENTION.

BY W. C. HORNE, NEW YORK.

THIS body held its thirteenth anniversary in New York, at the Dental College Rooms, commencing at 11 A.M., Tuesday the 5th of March; Dr. W. B. Hurd, of Williamsburg, presiding. The attendance at the various sessions was better than for a number of years past, and the interest in the proceedings did not flag up to the hour of adjournment on Thursday night.

After organizing, the first session was occupied by a discussion of the effects of rubber plates upon the mucous membrane of the mouth, the subject having been introduced by Dr. J. B. Rich, who complained that this material caused the mouth to become sore. By some present this was attributed in common to all closely fitting plates; others accounted for it on the hypothesis that rubber being a poor conductor, the parts which it covered were continually kept at the same temperature.

Dr. Atkinson believed the principal cause of the evil referred to was the mechanical closure of the mucous follicles, leading to the deterioration of the mucus, proceeding even to the production of pus. Gold, he said, was more compatible with the typal force, or indwelling ghost, than rubber or any other substance.

Dr. Rich had seen two cases lately of sore mouths which had been immediately relieved by the exchange of gold for rubber plates. To his mind this was sufficient to condemn the material for dental uses.

Dr. Horne remarked that vulcanized rubber was more or less porous, according to the amount of earthy matter present, and was capable of absorbing the fluids of the mouth. Of course this would be a reason why it should be offensive to the sense of smell, and the impurities present would readily account for sore mouths where they occurred.

Several members denounced rubber as a curse to the community, while the evils attributed to it were considered by others as incidental to the misuse of a valuable article.

Nitrous oxide shared a denunciation similar to that bestowed on rubber; its abuse being used as an occasion for condemnation *in toto*. This view was not however generally received. There was universal reprobation of the great injury done by the indiscriminate sacrifice of teeth at the extracting depots in our principal towns and cities.

The Report of the Committee on Lamm's Gold being called for, in the

absence of the chairman (Dr. Arrington), Dr. Atkinson made a verbal report, embodying his own views on the preparation, the substance of which was that the ordinary adhesive foil is ahead of any crystal gold or other preparation he had ever known. Fillings of Lamm's gold, put in wet some months since, had crumbled; and the material wasted much in using. He did not believe in filling teeth under saliva, and wanted nothing that would encourage such operations. As a substitute for adhesive foil he would not take this gold as a gift.

Dr. Rich said that with the microscope he could find iron in this preparation; and it was further objectionable because it must be packed with blunt points.

Dr. Fitch had seen a plug of this material inserted wet. Its introduction took more time than would be required for foil, and the surface was inferior. He could have no reliance on such operations.

Dr. Mills related at some length his experience in using it, dry and wet, which had been very satisfactory. It could be used very rapidly and without waste. He did not think the committee had had sufficient experience to give a fair report.

The Committee on Revision of the Constitution and By-Laws, appointed at the last annual meeting, made a report through its Chairman, Dr. Rich, which was accepted and laid on the table. It provided for the permanent location of the Convention in New York City; for a change of name to that of The American Institute of Dental Science, the officers to be elected for three years.

At the evening session the discussion of Operative Dentistry was entered upon; generally illustrated by diagrams on the blackboard. Dr. John Allen and Prof. Buckingham both referred to the great advancement lately made in this department. This elicited a response from Dr. Rich, who said that the adhesive properties of gold had been known and made available by different operators for the past 30 years. He laid down as general rules that each piece of gold should be made as hard as possible, and the pressure applied mainly in one direction. He preferred using thin foil, even No. 1, folded into ribbons of the width of the instrument to be used. He always rounded the outlines of the margins of cavities, never leaving any because they were difficult to file perfectly. He works with hand force and steady pressure, by extension of the fingers. He condemned filling with cylinders, as they could not be adapted closely to the walls of the cavity.

Prof. Truman illustrated his mode of filling approximal cavities in an incisor, by means of two retaining points at the cervical wall and one toward the cutting edge; in these he used soft foil, also next the labial wall to secure perfect adaptation.

Dr. Varney said he would not depend on retaining points for holding gold plugs, nor would he leave frail walls standing, but would cut them away and supply their loss with gold.

Dr. Crowell said in using drill pits, he connected them by grooves and polished the margins of the cavities with French slate pencils. He favored restoring incisors with gold, instead of pivoting. He urged the use of a pocket microscope for examining the edges of cavities after using the bur, file, or excavator; they would be found rough, and with particles of bone remaining which would not wash away.

Dr. Clark objected to a conspicuous display of gold in teeth. He thought some dentists wanted to show what they could do more than to serve their patients. Ladies do not like to have the fillings in their teeth the subject of remark.

Dr. Perkins said he was much less in favor of restoring the contour of teeth than formerly. Many of the cases where a high price was paid he was sure would prove of little profit, for the walls would certainly break away. In some cases they would last, but in others all the powers above or below would not save them.

Dr. Ambler would rather leave spaces between the teeth than build out with gold. As an evidence that it was not always liked by patients, he mentioned a lady who came to him to have two central incisors extracted which exhibited a great deal of gold. He declined to do it, but she found some one more obliging who would.

This brought out Dr. Atkinson, who replied to the last speaker and extolled the new method of operating.

Dr. Rich said the process of building out gold fillings had been practiced for the last 30 years; he had done it from the first of his practice. Dr. Townsend, of Philadelphia, Dr. Lord, of this city, and several others had done such work; he saw nothing new in what the members present had been talking about. Such operations were often impolitic; the gold cannot be retained in many instances, the force of mastication crushing both teeth and filling.

Dr. McIlroy described an ingenious method of filling a class of cavities in bicuspid teeth. Each approximal surface being decayed, and communicating, but leaving a strong wall between the cusps and around the orifice of communication; he prepared a plate of fine gold for covering one of the openings through the internal partition, and held this in place with an instrument until he had filled around and over it. The opposite side was then treated in a similar manner.

Dr. O. Jarvis made objection to the use of the term welding as applied to the union of particles of gold by pressure. This led to some discussion, which proved that the only difference of opinion entertained was as to the meaning of terms.

Dr. C. E. Latimer called attention to the gross incompetency exhibited by many claiming to be dentists. He exhibited two central incisors which he had extracted, containing a plug of amalgam, common to both, and also a specimen of teeth on vulcanized rubber of very discreditable ap-

pearance. Such operations, he said, were not only an injury to the patient and a disgrace to the dentist, but they brought a stigma upon the profession.

This discussion continued to the close of the morning session of Wednesday. At 2 P.M. the Convention again met and listened to a lecture on The Functions of the Spinal Cord from R. K. Browne, M.D., Professor of Physiology in the New York Dental College.

The Report of the Committee on Revision was then taken up and read, and after a short discussion was indefinitely postponed.

An election for officers was then held, resulting in the choice of Dr. J. G. Ambler for President; W. H. Allen for Vice-President; W. C. Horne, Recording Secretary; J. S. Latimer, Corresponding Secretary; J. S. Smith, of New Haven, Treasurer.

The retiring president, Dr. Hurd, then briefly addressed the audience, after which, Dr. Ambler took the chair.

Owing to the commencement exercises of the Dental College, no evening session was held.

The session of Thursday was opened by a paper from Prof. Truman on Nerve Fibres, which was received with marked attention. A discussion then arose as to the preservation of exposed pulps. Oxychloride of zinc was recommended as a filling in such cases by several gentlemen who had used it successfully. Among the number were Drs. Robbins, Salmon, Searle, and Jarvis.

Dr. Buckingham said that the dentists of Philadelphia had settled down to the rule that when a pulp was exposed it should be devitalized and removed.

F. D. Weisse, M.D., Professor of Anatomy in the Dental College, at twelve o'clock, delivered a lecture on the Structure and Development of the Dental Tissues.

At the commencement of the afternoon session Prof. R. K. Browne again addressed the Convention on the Nervous System. A unanimous vote of thanks to Profs. Browne and Weisse was then passed.

The time of the next annual meeting was fixed for the first Tuesday in June, 1868, in the City of New York.

The President announced the following Executive Committee: Drs. F. H. Clark, C. E. Latimer, J. M. Crowell, G. H. Perine, F. Searle.

A vote of thanks was passed to the Trustees of the Dental College for the use of their rooms.

The final adjournment took place at half-past eight o'clock, after which the Convention sat down to an entertainment provided by a committee of the New York and Brooklyn dentists at the St. James Hotel. The guests were briefly welcomed by Dr. J. G. Ambler, who presided, and after they had partaken of the various delicacies provided, the chairman introduced Dr. C. A. Marvin, of Brooklyn, who made a congratulatory speech on the happy auspices of the reunion.

The following sentiments were then offered and responded to by the gentlemen named.

The American Dental Convention, the Democratic Council of the Profession.—Dr. W. B. Hurd, the retiring president.

Our First President.—Dr. J. B. Rich.

Our Friends from Abroad.—Dr. H. J. McKellops, St. Louis.

The Dental Colleges.—Dr. W. H. Dwinelle.

Dental Education.—Dr. W. H. Atkinson.

Our Dental Societies.—Dr. C. P. Fitch.

Dental Literature.—Dr. Shepard, of Salem.

The Dentist the Conservator of Health and Beauty.—Dr. J. Allen.

The Dental Laboratory.—Dr. W. B. Roberts.

The Medical, Surgical, and Dental Professions.—Dr. F. D. Weisse.

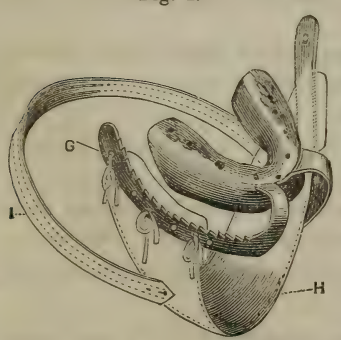
At twelve o'clock the company retired, with a single sentiment of pleasurable satisfaction at the reunion of so many members of the profession on an occasion of such interest. The Committee of Arrangements consisted of Drs. G. H. Perine, E. A. Bogue, W. C. Parks, A. L. Northrop, O. Jarvis, to whose efforts were owing the success of the entertainment.

PROCEEDINGS OF THE ODONTOGRAPHIC SOCIETY OF PENNSYLVANIA.

(Continued from page 420.)

Fig. 4. This splint is made of tin. Six or eight sizes might be cast (and kept ready for use), from which one could be selected suitable for the jaw. The wings are of malleable iron, tinned to prevent rusting and for more readily soldering. Three sizes would be sufficient to select from.

Fig. 4.



G, wing of malleable iron, projecting, with its fellow, from the splint to which they are soldered. H, mental or splint band, with the end left up to show the manner of trying it. I, neck strap.

The splint should have a handle in front, that it may be used as a cup to take the impression of the jaw—the holes being useful to allow a small probe to be pressed through the wax down to the teeth, thus allowing air to enter to facilitate the removal of the impression, and when in use as a splint giving entrance to warm water, thrown from a syringe, to keep the parts clean.

The splint should be made to fit well by bending, cutting off the edges and rounding them up smooth. When a tooth projects so as to keep the splint from fitting, a hole may be cut to let the tooth through, if the metal cannot be hammered out. This should all be done before taking the impression, as a well-fitted cup assists greatly in this important matter.

(The adaptability of this splint is shown in the fact that the one from which the cut was taken had been used successfully on two different jaws, so unlike that the first was a quarter of an inch wider, where the ends of the splints rested, than the second. When fitting it to the second jaw, it was necessary to cut off a part of the right wing, to keep it clear of the corner of the mouth. This accounts for the difference in the width of the arches as seen in the cut. The indentations on the top of the splint were made by the boys in eating.)

After the *cast* is obtained, the handle in front should be cut off, and the wings, *if needed*, soldered on, care being taken that their edges are clear of the corners of the mouth, when *open*. Warm gutta-percha should then be placed in the splint, pressed down on the cast, and, after cooling it in water, dig out the softened plaster.

If the splint is found to rock on the teeth, it should be removed, a *little warm* (not hot) *water* be poured into the lining, then carefully replaced upon the teeth, and slightly pressed down. It will then fit perfectly. This lining will be of such form that it will come off the teeth readily, therefore the jaw can be examined when desirable.

The gutta-percha could be placed in the splint and applied *directly* to the teeth and gum, if the jaw is set *sufficiently firm*, as there would be no difficulty in drawing the lining off before it was cold, to remove the ligatures. But if they are put on so as to keep clear of the gum, they might be left during treatment, as the lining would prevent them from moving the teeth.

If the jaw retains its place when the gutta-percha is pressed down, the splint might be *left* on. In this way the gutta-percha, by embracing the teeth, and fitting in between them, would hold the fragments of the jaw firmly in place.

It is, however, much more difficult to apply gutta-percha than wax, as it requires more heat and pressure.

When the jaw can just be held in place, but will bear but little pressure, hardly that of warm wax, plaster of Paris might be used as a lining. In many cases it would hold the fragments in the splint for a long time.

This splint can be used without wings, in any way that Fig. 1 will answer.

The mental or splint band must be used when there are no teeth suitable to fasten to. This is frequently the case in children. This band may be removed for washing when necessary, care being taken that the patient keeps the jaws closed during the removal, in the earlier stages of treatment.

The splint has so far been spoken of in its adaptation to fractures in which the jaw is allowed to *move*. It can also be used instead of Figs. 2 and 3, by soldering suitable portions of another splint on the upper part, to hold the lining for the upper teeth. When the teeth are not fit for screws, the cap of Fig. 3 could be used, with long tapers to reach down to the wings beside the lower jaw, if a ready-made lower wing could not be fitted so as to act in place of an upper one.

No care will keep this splint as pleasant as one made of rubber. Gutta-percha absorbs, and becomes very offensive, but the small quantity used for lining the splint is protected and covered so that, with great cleanliness, it may be worn with little annoyance.

This splint has the advantage of being easier of application, and can be applied, if ready made, in much shorter time than a rubber splint.

In fractures treated with either kind of splint, the trouble and anxiety are over when the splint is on, as there is then no chance for the jaw to get misplaced.

In ordinary cases the splints may be removed during the first three days, if any edge is pressing so much into the gum as to be painful. With proper care in the fitting this will be unnecessary.

These splints hold the fragments so well together that I have seen badly lacerated gums heal up, in from two to three days, so perfectly that the fractures were then only simple.

No bad effects are produced by splints covering the teeth and gum. On the contrary, teeth that are so much loosened by the injury as to be beyond recovery in the usual treatment, are securely held by the splint and become firm again. The gum looks red and soft while the splint is worn, but a short period suffices for its complete restoration, even when it has been covered up for months. I generally leave the splint on long enough to feel assured that temporary removal will not endanger the union, which is very delicate for some time. How soon this will be, after the first application of the splint, and how long before the splint can be dispensed with, depend upon the gravity of the injury and the state and age of the patient.

With the fragments held in place, little apprehension need be felt of those painful abscesses, exfoliations and other complications so often present in the usual treatment. The advantages of splints over bandages are so great that nothing but experience will give a full appreciation of them to any one. I am able to speak positively upon this point, as nearly all the cases treated by me had been found unmanageable by the old methods, before coming under my care, and some of them were gravely complicated.

The following are examples:

Case 1.—A seaman, senseless from explosion of powder on board a Spanish frigate, was sent to the United States Naval Hospital. A comminuted fracture of the lower jaw was found between the canines, a piece of the bone loose in the mouth, the teeth of both jaws much shattered, with face severely burnt and lacerated. The case had been carefully treated for over four months without producing any union, when, by the advice of Surgeon Bache, Director of the Naval Laboratory, I was requested to treat it. The jaw was contracting from loss of bone, and pieces were coming out through the chin. I applied a hard, vulcanized rubber splint, which inclosed the remaining teeth and gum of the lower jaw, its upper surface fitting well over the teeth above, except in front, where it was trimmed down to allow food to pass between the remnants of the superior incisors. The splint was fastened to the lower jaw by screws passing into a broken tooth on each side. The jaw was held up by starched muslin, moulded to a cast of the parts, in repeated folds, until a line in thickness.* This reached to the zygomas, and was kept up by a band passing over the head. The splint was applied February 12th, 1861. Fragments of the bone came away for some time after, but the splint was not removed during the treatment. The jaw united well by the middle of May, and the man was sent home to Cuba.

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* A bandage of thick gutta-percha was tried first, but it yielded to the shape of the jaw so much that it increased the tendency to contraction. The pliancy of gutta-percha is a radical objection to its use in or out of the mouth, except when it can be supported.

Splints of similar construction, but without screws, and with a different bandage, were subsequently used with great success in over forty cases in one of the hospitals of the Confederate army in 1864.*

Case 2.—I received a compound fracture in my own jaw between the right canine and lateral incisor teeth on November 4th, 1862, through my horse falling under me. The bone was much displaced and two incisor teeth loosened. I set the bone, and it was held by strong, well stretched silk, inclosing three incisors, the right canine and first bicuspid. This stopped the bleeding forthwith and held the bone firmly. A vulcanite splint was applied thirteen hours after injury. It inclosed all the lower teeth, and was fastened by gold screws to the first molars. It held the fragments so well that I was able to attend to patients in the afternoon, and continued to do so subsequently. The gum united by first intention, and the pain and swelling, which were very great in the external parts, diminished rapidly.

November 28th the splint was removed, and good but flexible union found. It was again fastened on, but after seven days was worn without the screws, and removed daily. The jaw grew strong, the teeth firm, and the splint was left off January 1st, 1863, but worn at night until February 1st. Jaw was used in eating, talking, etc., throughout the treatment. The incisor teeth have regained their communication with the inferior dental nerve. This was severed by the displacement of the fragments, which was so great as to admit the little finger between the teeth. Judging from the sensation of slight tightness between the front teeth in certain movements of the muscles, the bone was twelve months in growing as stiff as before the accident. The case was presented to the New York Academy of Medicine, January 7th, 1863, by Dr. A. L. Sands. Professor Alexander Stevens said the splint was a great improvement, and that the treatment would last forever.† The splint was brought before the Medical Society of the State of New York in February.‡

Case 3.—G. B., forty-five years old. Jaw fractured through socket of right second bicuspid, June 5th, 1863, by a blow. Displacement of back fragment inward and forward. Patient could not lie down, but slept in a chair, *holding* the jaw, as the surgeons could not keep the fragments in place. The fracture commenced inside the first bicuspid tooth, and passed backward and outward through the socket of the second, and downward also, at the expense of the back fragment. As the loosened bicuspid had been extracted instead of being kept in place, there was nothing to prevent the back fragment from sliding inward and over the front one. It was set and held in place by a jackscrew, of which one end rested on the left side, between the first and second molar teeth. The other end went into the short fragment, about the centre of the fracture, and as low down as the muscles under the tongue allowed. This held the parts firm while the impression and bite were taken, the mouth cup being notched out to go down over the ends of the jackscrew. On the 17th I applied a splint like Fig. 1, without screws, but held down by a strip of silk passing under the chin, and, supported by wings which projected from the splint, came out over the lower lip, and continued along the

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* See Richmond Medical Journal, February, 1866.

† See Bulletin of the Academy.

‡ See the Society's Transactions for 1863; *New York Medical Times*, August 8th, 1863; DENTAL COSMOS, September, 1863.

sides of the jaw like the wings of Fig. 4. Splint held the bone in place, although there were but two loose teeth in the back fragment—first molar having been out for years, and the second bicuspid lost through the fracture. Patient could now lie down comfortably. The band was worn snug until June 24th, when it was slackened because of painful swelling under the chin. No displacement following, the band was worn loose afterward. July 20th, splint removed to examine the jaw and flexible union found; 29th, callus firmer. August 8th, improving; 18th, wings cut off, but splint worn until September 3d. Jaw allowed its natural motions throughout treatment.

This splint was presented to the New York Academy of Medicine, in October, 1863.* I received the thanks of the Academy, accompanied by a request to report further when I should have completed the splint which I considered best adapted for general use. In answer to this request, the splint represented by Fig. 4 was fully described in the paper mentioned at the head of this article.

Case 4.—J. Q., twenty-five years of age, had his jaw broken by being thrown from a cart, December 29th, 1863. On the same day he called in a physician, who tied the teeth together and sewed up a deep gash over the left masseter muscle. The ligature did not permanently control the fracture; the teeth became very loose and the front of the jaw was drawn back inside of the left fragment. Patient went into the Bellevue Hospital January 9th, 1864. The left lateral incisor, loosened by the accident, having been extracted, attempts were made to hold the jaw in place by passing wire around the teeth, but without success. January 14th patient was brought to my office. I find the jaw fractured through the socket of the left lateral incisor, slanting toward the symphysis as it descends, thence back at the expense of the inside of the left fragment. The gum is red and painful; great tenderness under the jaw and upon the ramus, which was also *supposed to be fractured.* I find it is not. The gash across the left masseter muscle is about two inches long, and through it the bone can be distinctly felt with the finger; much swelling, which is extending; pus discharging freely into the mouth and externally from the wound near the angle. Tied the fragments, taking in the remaining incisors, both canines and left bicuspids in the ligature, as the central incisors were quite loose, the one next the injury and also the left canine so much so that the fingers would have taken them out easily. A piece of wood was placed endwise across the socket of the extracted lateral incisor, bearing against the central incisor and the canine, to prevent displacement while taking the impression. This held the fragments in place, but it was impossible to get the jaw into its natural position relatively to the upper. The left masseter muscle, weakened by the cut, having been inactive for so long a period, the parts had settled over to the left, and I was obliged to take the bite in that position.

January 15th. Applied a vulcanite splint, like Fig. 1, without screws or any other fastening. It held the fragments in place, and the patient experienced great relief. February 13th, took off the splint temporarily, no displacement followed, but union was very soft. After this, removed the splint and examined the parts weekly. March 19th, the wound is healed. Removed the necrosed socket of the extracted incisor. Union

* See Bulletin of the Academy.

firmer, teeth improved. April 9th, union strong, but it is advisable to wear the splint longer, on account of the canine tooth, which is growing firm. The jaw now articulates with the upper, and the upper and lower teeth fit against each other well. May 1st, splint dispensed with.

I have used this kind of splint on many patients, and always successfully. Among them were cases which had been treated, without avail, in civil and military hospitals of this and other places. I have never seen it fail to hold the bone in place, although used without any fastening in the mouth, or support externally from bandage. In one case the jaw was broken by a Minié ball into seven or eight pieces, and part of them, with one tooth, lost.* In another much of the mental process was shot away, together with three front teeth.

Case 5.—Mary Ann D., twenty-nine years old, was found in a state of insensibility February 12th, 1864, and sent to the Bellevue Hospital the next morning. She remained unconscious until the 16th.

February 17th. Dr. R. B. Brownell spoke to me of her broken jaw, but said nothing could be done to it at present, as her head and face were so terribly swollen.

February 21st. Saw the patient at the hospital, and found her lower jaw broken on the right side, commencing half an inch back of the canine tooth, and passing downward at the expense of the back fragment. There have been no teeth back of the canine for some time, and, the gum being torn, the back fragment rides over the front, with its point sticking out sharp and bare, for three-eighths of an inch, in the direction of the symphysis. Although there is much swelling around the fracture, in and out of the mouth, also over the left zygoma and down the ramus, there is *great mobility* of the front of the jaw.

February 22d. Patient was brought to my office. Swelling on the face lessened somewhat, but still undiminished in the gum around the fracture. On the left side there are no teeth back of the bicuspid, and the gum is sound and healthy, but indented by the upper wisdom tooth which has been pressing into it since the accident, previous to which it had not done so, except when the gum was swollen eighteen months before. This condition of the parts induced me to examine the left ramus carefully, and I found great play of its upper back portion, especially inward, but the only displacement when at rest, is upward and forward, and this to no great extent, as it is checked by the upper wisdom tooth. Finally concluded that a fracture exists in the neck of the condyle, passing

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* I extracted this tooth, the left central incisor, it being forced out in front, as the lateral had closed up so as to touch the right central incisor through the contraction of the parts, the fracture being two months and ten days old when I took charge of the case. One fracture went down through the socket of the ejected tooth, and another between the second left bicuspid and first molar. The alveolar inside the four teeth between these fractures was all necrosed, and that outside completely loosened from the bone below, the separation being horizontal and on a line with the end of the roots. This alveolar, with the four teeth attached to it, would have turned down externally at a right angle had the gum been cut vertically at the ends. I took away the necrosed portion, made the outer part fit at the symphysis, and set all in place. The splint was applied July 22d, 1864. When it was taken off, December 11th, the jaw was united in every part, and the teeth were all fast, with the gum firm around them, but on the inside not quite as high as on the corresponding teeth of the other side of the mouth. To avoid being sent to the army again, the man wore the splint three months longer, without my knowledge, but the teeth and gum were not injured any by it.

downward and backward, thus allowing the muscles to draw the bone upward and forward.

The lower jaw contains only the four front teeth, the two canine and first left bicuspid. The gum back of these is free from roots, except that of the right wisdom tooth, which still remains, but decayed close down. The upper jaw has been without the eight teeth forward of the second bicuspids for some time; of the other eight, seven still remain, the right second molar only having been extracted.

To set the jaw, the right fragment was put in the best position that could be obtained with the fingers, assisted by a stout piece of silk passing round the left canine. A jackscrew, with a collar fitting against the root of the wisdom tooth in right fragment, and the other end bearing on the gum between the left lateral incisor and canine teeth, was then screwed out until the extension was sufficient to allow the fractured bone to come into proper position. The end of the long or forward fragment was then held up, and an impression in soft wax taken of all the teeth and gum, as far back as the ramus on each side. Care was taken to put the bone in place at the neck of the condyle while the bite was obtained.

February 28th. Applied the splint.* The surgeon who brought the patient to my office wished to try and hold the chin up with a leather bandage of Hamilton's pattern. It held the chin up very well for a short time, when tightly buckled, but in an hour the jaw fell away somewhat.

February 29th. Swellings on the head, temples, etc., with pain caused by the bandage.

Compresses were placed over the head and temples, and great pains taken to prevent the bandage from hurting. It was worn so loose that the teeth went up and down in the splint to such an extent that it was feared the jaw would get out entirely.

March 2d. Patient brought a request from the surgeon in charge of her case at the hospital that I would screw the splint fast to the teeth, that the bandage may be dispensed with, for the swellings on the head, temples, etc. are much increased. The lower lip is also very painful on the right side, in front of the canine. Gum has grown over the point of the bone; it is therefore only a simple fracture now. Screwed the splint fast.

March 10th. Swellings caused by the bandage nearly gone. Patient complains of pain in swallowing. Removed splint, and shortened the left end, which had cut into the palato-glossus muscle. Bone is united so well as to keep its form, and the fracture at the neck of the condyle is doing well. No complaint as to the teeth.

March 14th. Patient in good spirits and quite comfortable. Wants to leave the hospital and go to work. No complaint as to the teeth.

March 26th. At my request patient was discharged from the hospital, but still wearing her splint.

April 8th. Splint removed and good union found. Splint was worn just forty days, but the patient has a fine constitution and the bone united rapidly.

June 7th, 1865. Patient sent me word that the jaw was all right.

In this case the fractured jaw was held by the splint in proper relative

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* See Fig. 2, taken from the original.

position to the upper jaw, but in the next case the jaw was held *out* of its proper position.

Case 6.—Patient thirty-six years old, the son of a physician in Brooklyn; jaw fractured through the symphysis, and the right condyle dislocated outward and backward, February 10th, 1866, in falling down stairs, and striking the chin on a small desk. The dislocation was reduced, but the displacement of the jaw being found uncontrollable, I was called in consultation.

February 14th. Patient has been confined to his bed since the accident, motion being insufferably painful. The right side of the jaw is so much out of place that the lower back teeth strike nearly outside the upper. At the point of fracture, the left fragment is inside the right with a lateral displacement of five or six lines, and nearly that much vertical displacement. Much swelling and pain under and inside the front of the jaw, with terrible suffering in the right glenoid fossa and ligaments when the condyle is moved. There is a firm, smooth swelling upon the outer part of the neck of the condyle, but nothing that indicates fracture of the bone, although the back teeth touch too soon, and it is impossible to get the lower bicuspids up to those above them. This is probably caused by some displacement or injury of the interarticular cartilage, which allows the condyle to go up too far into the glenoid fossa. The left side of the jaw will move in any direction, being uninjured, and the muscles in good condition (except at the symphysis). This accounts for the fragments being carried over to the right side, where the ligaments and muscles are so *crippled* as to be *unable* to *balance*, or antagonize those in good condition on the left. Packthread was passed around the left bicuspid, with a piece of wood through the other end, to assist the fingers while the bone was drawn over to the left side. At the same time this fragment was pressed down with the fingers, aided by levers and wedges of wood. The muscular resistance to motion was so great that all efforts to bring the fragments into position were ineffectual for a long time, although the left half was drawn steadily over to its own side. But after two hours' effort the parts yielded sufficiently, and a piece of wood was fitted across the roof of the mouth, between the upper teeth, and extending under their crowns. Its lower surface was cut out to receive the teeth of both sides of the lower jaw, and the fractured ends, at the symphysis, were secured by thread passed around the teeth. The patient felt much relieved by this, although exhausted by the pain experienced in accomplishing it, as it was not thought advisable to give anæsthetics. Probably the parts would have come into place readily under their influence, but whether they could have been held there so well afterward is more doubtful.

February 15th. Patient walking round, feeling much better. The halves of the jaw are in comfortable position. The parts near the fracture have improved greatly since relieved from the pressure of the displaced ends of the bone, and the jaw opens wider. Took wax impression of upper and lower teeth, etc. The lower jaw being only imperfectly set, the plaster cast was sawed apart between the central incisors and adjusted by the upper cast. The packthread was still allowed to remain on the lower bicuspid, that the patient might draw the jaw into place, should it settle to the right again.

February 16th. The general condition of the soft parts much improved, but no difference in the right articulation. It is yet impossible

to set the halves of the jaw together properly, without bringing the left half down to meet the other. The right condyle, although apparently in its place in the glenoid fossa, is not so, as the back teeth on this side meet too soon, so that the teeth cannot close, at the canines, by about two lines. The *left half* was therefore brought forward at the condyle, *until a full quarter of an inch down at the wisdom tooth and the same at the canine.* In this position, it was set up in the wax resting upon the upper teeth and the bite taken. When the casts were placed in the wax bite, to form the mould for the splint, the upper and lower right wisdom teeth were separated about a line. This was done in the hope that when the splint was applied the parts might yield, so as to allow the condyle to fall away some.

February 19th. On applying the splint the right fragment would not go up into place, even under much pressure, until the part between the crowns of the wisdom teeth was all cut away—showing that no improvement has taken place in the joint to this time. The right wisdom tooth is hard against the one above, while the canine teeth and the other wisdom tooth are considerably below the upper ones. Splint left unfastened.

February 20th. Patient very comfortable, except that the edge of the splint cuts the gum a little. The splint was removed and made easy, then screwed to the first right upper molar and left canine, and to both lower canines. The jaws are held as close together as the back teeth permit, for as all the four upper incisor teeth have been absent for some time, the opening in the splint is large enough without depressing the lower jaw. A channel is cut in each side of the splint, that the saliva from the parotid glands may get into the mouth.

February 24th. Patient very comfortable and much pleased with the splint. All going on well.

March 16th. Swelling set in over right condyle and ramus in the beginning of the month, but passed off. About the same time the part under the symphysis opened, but closed up after a teaspoonful of pus had discharged. The swelling on the neck of the right condyle is still very painful; doing well in other respects.

March 30th. Swelling all gone, except the small lump near right condyle, which is still painful. Left central incisor (next to the fracture) quite tender, and pus discharging from its socket.

April 12th. Tooth better. Swelling near condyle less painful.

April 22d. Swelling near right condyle much less painful. Splint has been worn sixty-two days, and been on without a moment's intermission just sixty-one days. Removed it and good union found. Upper part of the splint cut off, and the *jaw allowed to move*—the lower part being put on again, as the union is not yet stiff enough. The jaw is therefore left in a splint, like Fig. 1, but still screwed to the canine teeth.

May 18th. Splint dispensed with. Jaw firmly united and the same shape as before the accident. *Also going into its place as regards the upper jaw,* the top of the splint, where the points of the upper teeth rest, having been cut down about once a week since the jaw has been allowed to move. It continued to improve and go up closer to the upper teeth until the beginning of July, when it was nearly in place. The jaw moved very well *up* and *down*, but the right condyle had very little ability to come forward in the lateral movement of the jaw.

September 8th. The patient is out of town; but I have heard from several sources that the jaw is all right.

September 15th. The patient's father says the lateral motion is nearly perfect again, and the jaw in place.

This case shows the necessity of some intervening support between the teeth in some cases during treatment, and therefore affords another argument in favor of interdental splints.

Case 7.—P. N., thirty-six years old, was struck with a club on the left side of the jaw, August 19th, 1866. Went to the Demilt Dispensary, from whence he was brought to me, August 22d. Find the jaw-bone broken on both sides. The lower lip and parts covering the mental process have little sensation, owing to the separation of the inferior dental nerves. Fracture on the left side, between the bicuspids; it is square across, vertical and smooth. The bicuspid teeth quite firm. The first downward and forward about four lines from the second. The other fracture is through the socket of the lower right wisdom tooth, leaving one root in front fragment, while the crown of the tooth is held by its back root, in the part attached to the ramus. Fracture passes down, inclining to the angle. The back fragment keeps forward and up, so that the wisdom tooth strikes against the upper teeth, while the forward fragment is full half an inch down when at rest. Much swelling, pain and discharge of pus. The jaw settles over to the right. The teeth above and below are all present, except the lower left wisdom tooth, and pretty firm, except the one in the fractured socket. Both upper and lower teeth show distinctly where their antagonists closed against them. The lower jaw shuts a trifle outside the upper at the *right* bicuspids, owing to a very peculiar curl outward of the *left* angle, which has caused the muscles to swing the jaw over somewhat. The patient says this irregularity was caused by the kick of a mule, when he was about nine years old. Tied the bicuspids together with silk, and took a wax impression of the fourteen teeth, leaving out the elevated wisdom tooth, of which an impression was taken separately. The parts were not precisely placed, therefore the plaster-cast was sawed apart betmeen the bicuspids, and adjusted by the cast of the upper jaw. The wisdom tooth was added in the same way. The lower cast then included the fifteen teeth of the lower jaw, *all in place.* It was placed against the upper cast, and *both set in an articulator.* The jaws were then opened nearly three-eighths of an inch, and a gutta-percha splint made. This was tried in the mouth, and being right was trimmed to the form required for the splint; then, with the upper and lower casts, set in a vulcanizing flask, with the female screws all in place. After the plaster had set, the flask was made quite warm, in order that the plaster teeth should not be broken when drawing out the gutta-percha to make room for the rubber. The opening in front of the splint reached from one canine to the other, and from the points of the upper teeth to those below, and holes were made through the sides for the saliva.

(To be continued.)

EDITORIAL.

AMERICAN MEDICAL ASSOCIATION.

The eighteenth annual meeting of the American Medical Association will be held in Cincinnati, on Tuesday, May 7th, 1867, at 11 o'clock A.M.

The following committees are expected to report on subjects of interest to the dental profession:

On the Use of Plaster of Paris in Surgery, Dr. Jas. L. Little, N. Y., Chairman.

On Local Anæsthesia, Dr. E. Krackowitzer, N. Y., Chairman.

On the Deleterious Articles used in Dentistry, Dr. Augustus Mason, Mass., Chairman.

Liverpool Dental Hospital.—Dr. W. H. Waite, of Liverpool, has been appointed an honorary dental officer to this institution.

Liverpool Chemists' Association.—On the 14th of February, a lecture was delivered by Dr. W. H. Waite, of Liverpool, on the "Chemical and Physiological Structure of the Teeth." The subject was introduced by a brief notice of the various forms of dental organs found in the animal kingdom, including those of the Radiata, Mollusca, Articulata, and Vertebrata, the mouth of man presenting the most perfect dental arrangement. A description of the various kinds of human teeth, their forms, their number, their position in the dental arch, and their functions followed; after which the structure of the teeth as revealed by the microscope was minutely detailed, and various theories as to the presence of "nerve fibrillæ," "interglobular spaces" in dentine, etc., chemical, vital, and mechanical causes of dental decay, etc., were noticed and discussed. The anatomy of the "fifth pair of nerves" in its relation to the teeth, together with the blood-vessels which pertain to those organs, with several other particulars relating thereto, made up a very interesting and instructive lecture. Illustrations by diagrams prepared for the lecture. The thanks of the Association were awarded to Dr. Waite at the close.

OBITUARY.

The Late John R. McCurdy, Esq.—At the annual meeting of the Board of Trustees of the Pennsylvania College of Dental Surgery, held on the 26th of February, 1867, it was

Resolved, That we have heard with deep sorrow of the recent death of John R. McCurdy, Esq., for many years a member of this Board. By his uniformly genial and kindly deportment, he had won the affection and esteem of all who knew him, and in his long connection with the dental profession he had become identified as the ardent advocate of its best interests. In his untimely death, the Board feel that the College has lost one of its earliest and most steadfast friends.

Resolved, That we offer our warmest sympathies to his family in their bereavement, and that the secretary be requested to convey to them a copy of these proceedings, as a slight expression of our feelings on this mournful occasion.

BIBLIOGRAPHICAL.

The American Journal of Dental Science.—A prospectus has been issued stating that this Journal, after being discontinued for a few years, is to be revived under the editorial management of Profs. Piggot and Gorgas, of the Baltimore College of Dental Surgery. It is to be published monthly, commencing with May, 1867. Trusting that it may sustain the well-earned reputation which the magazine enjoyed under the care of the lamented Harris, we welcome its reappearance with the conviction that it will contribute largely to advance the interests of science and art. J. H. M'Q.

Transactions of the American Dental Association.—The Chairman of the Publishing Committee of the American Dental Association, Dr. L. D. Shepard, of Salem, Mass., expects to have the Transactions ready to be issued to members of the Association some time in the course of the next month. J. H. M'Q.

SELECTIONS.

American Journal of Science and Arts.

On Photomicrography, with the highest powers, as practiced in the Army Medical Museum. By J. J. Woodward, M.D., Assist. Surgeon and Brevet Major U. S. Army, in charge of the Record and Pension Division Surgeon General's Office, and of the Medical Section Army Medical Museum.

Photography had but just begun to attract attention when the attempt was made by Donné to reproduce microscopic objects by the Daguerrean process; and although the results of these experiments were far from satisfactory, they promised enough to lead to further efforts in this direction, renewed with each step in the gradual improvement of the photographic art. These exertions were crowned by a continual progress, which did not, however, keep pace with the development of other branches, of photography, though it must be admitted that in the hands of the more modern experimenters, and especially of Prof. Gerlach of Erlangen, Jos. Albert of Munich, and Dr. R. L. Maddox of Southampton, the success has been such as to guarantee a wide field of usefulness for this method of representation.

In America, the chief experimenters have been Prof. O. N. Rood, of Columbia College, and Mr. Lewis M. Rutherfurd, of New York. Besides these, mention must be made of the paper of Dr. John Dean, of Boston, on the Spinal Cord, which is illustrated by photomicrographs reproduced by photolithography. The work of Dr. Dean, however, was done with magnifying powers not exceeding ten or twelve diameters, while both Prof. Rood and Mr. Rutherfurd have experimented with very high powers.

Prof. Rood published a very interesting account of his process in this Journal in 1861. Omitting details, it appears from this paper that in his operations he used direct sunlight for illumination, and employed ordinary achromatic objectives with or without eye-pieces. The differ-

ence between the visual and chemical foci he endeavored to overcome by an alteration of the fine adjustment after the plan suggested by Shadbolt. Prof. Rood thus obtained photographs, chiefly of diatoms, so far as I have been able to learn, with powers as high as the $\frac{1}{7}$ objective, which gave with five feet distance 460 diameters, with about three feet distance and the long eye-piece 1300 diameters. The pictures thus obtained compared favorably with any which have been taken with achromatic objectives. In May, 1865, Mr. Lewis M. Rutherfurd, of New York, published a paper on Astronomical Photography. * * * * *

Such was the condition of photomicrography in America, when it occurred to me to resort to this method of illustration in preparing proper representations of the histological studies of camp diseases, which have been made by me or under my direction for the Official Medical History of the War of the Rebellion.

I at once visited Mr. Rutherfurd, whose paper had attracted my attention, and I received from him many important suggestions, which I desire to acknowledge in the fullest manner. Among these I may especially mention the plan of constructing the objective above indicated, the use of the ammonio-sulphate of copper, and the suggestion of substituting a properly constructed concave for the eye-piece.

In developing these suggestions, the actual manipulations were assigned to Asst. Surgeon and Brevet Capt. Edward Curtis, U. S. A., of the Army Medical Museum, and to his patience, tact, and ingenuity I am indebted for the successful issue of the experiments which were undertaken. The results attained have been most satisfactory, excelling, as is confidently believed, anything heretofore done in this direction. This is also the opinion of Dr. Maddox, whose judgment is of the greater value as he is one of the most successful laborers in this direction in Europe.

The principles involved in obtaining successful photographs with the microscope are the following:

1. To use objectives so corrected as to bring the actinic ray to a focus.
2. To illuminate by direct sunlight passed through a solution of ammonio-sulphate of copper, which excludes practically all but the actinic extremity of the spectrum.
3. Where it is desired to increase the power of any objective, to use a properly constructed achromatic concave instead of an eye-piece.
4. To focus on plate glass with a focusing glass, instead of ground glass.
5. With high powers to use a heliostat to preserve steady illumination.
6. Where an object exhibits interference phenomena when illuminated with parallel rays, as is the case with certain diatoms and many of the soft tissues, to produce a proper diffusion of the rays by interposition of one or more plates of ground glass in the illuminating pencil.

Strict adherence to these principles is indispensable to success. In the Museum they have been carried out by the following details:

A camera is not used—a dark room being found most convenient. The operating room has two windows, through one of which just enough yellow light is admitted to permit the movements of the operator. The lower part of the other window is occupied by a shutter about fourteen inches high, on which the blackened sash shuts down light-tight. In this shutter is a round hole an inch and a half in diameter, from the inner side of which a brass tube of the same diameter projects into the room. On the outer side of the hole is a rod about twelve inches long, on the extremity

of which the microscope mirror is duly centred. Two steel rods attached by hooks to the mirror and passed through the shutter, permit its position to be adjusted by a person standing inside of the room, without opening the window. A Silbermann's heliostat standing on a shelf just outside of the window throws the sunlight steadily upon the mirror. Within the room a frame of walnut, ten feet long, is placed on a firm table perpendicular to the window. The microscope stands on the end of this frame next the window, its mirror is removed, being replaced by that outside the shutter. The microscope is placed in a horizontal position, and the tube carrying the diaphragm or the achromatic condenser fits into the tube projecting inward from the shutter by which the sun's light reflected from the mirror outside is admitted. A black velvet hood covers the parts about the stage and objective of the microscope, and thus prevents the leakage of light into the room.

The plate holder is movable backward and forward on the walnut frame on which the microscope stands, its maximum distance from the stage of the microscope being nearly nine feet.

To permit ready focusing at distances greater than the length of the arm, a wooden rod, three-fourths of an inch in diameter and capable of easy rotation, runs the whole length of the right side of the frame. The milled head of the fine adjustment of the microscope is grooved, and a small grooved wheel in the end of the rod permits the two to be connected with a band. The operator standing at any part of the frame can therefore manipulate the fine adjustment by simply turning the wooden rod in his fingers.

The arrangements of light, position of object, coarse adjustment, etc., are made by the operator, who stands by the microscope, which has a suitable eye-piece adjusted, and observes the object in the usual way; afterward, removing the eye-piece and going to the plate holder, the final focusing is made by means of the wooden rod, the image being viewed with a focusing glass on a piece of plate glass held in the same frame which is to receive the sensitive plate.

The cell containing the ammonio-sulphate of copper hangs outside the shutter over the hole by which light is admitted. It not only excludes the unnecessary illuminating rays, but prevents danger to the objective from the concentrated solar heat, and permits the eye of the operator to view the objects about to be copied without fatigue or injury. Latterly a plate of alum has also been used to exclude solar heat, especially during any temporary removal of the ammonio-sulphate cell. The chemical processes employed are well known to all photographers. With the above apparatus, it has been found that the best defined pictures are obtained when the distance employed with any objective does not exceed three or four feet.

The achromatic concave used as a substitute for the eye-piece is a combination of somewhat more than half an inch transverse diameter, and about 28° angle, constructed, like the objective, to focus the chemical rays. It increases the magnifying powers of the objective about seven times. It has been found to perform well with both the $\frac{1}{8}$th and $\frac{4}{10}$th.

In photographing the soft tissues or other objects, in which illumination with parallel rays produces interference lines, the ground glass is to be placed between the mirror and condenser. Of course, there is considerable diminution of light; but this can be overcome, for the higher powers, by condensing the sun's light on the ground glass by a bull's-eye

or other similar contrivance. If the interference lines, as seen by the eye, do not disappear with one thickness of ground glass, two or more may be used.

The most powerful objective with which photographs have been taken in the Army Medical Museum is a $\frac{1}{50}$th, manufactured recently for the Museum by Messrs. Powell and Lealand, of London. The subject selected for the experiment was *Pleurosigma angulatum.* With the $\frac{1}{50}$th and three feet nine inches distance, and without an eye-piece, a picture of a portion of a frustule was obtained magnified 2,344 diameters. This negative readily bore enlargement to 19,050 diameters. The field in the picture is six inches in diameter, and is remarkably sharp in the centre, but shows considerable curvature, and on the edges is quite out of focus. Further experiments with the $\frac{1}{50}$th satisfied us that a greater power could not be advantageously obtained from it.

About the same time experiments were made with the Wales' $\frac{1}{8}$th, due amplification being given by the achromatic concave. It was intended to obtain with this the same power as with the $\frac{1}{50}$th, but, although the distance was reduced to three feet, the subsequent measurements showed 2,540 diameters, or about 200 diameters more than were obtained with the $\frac{1}{50}$th. This was the maximum performance of the $\frac{1}{8}$th, and readily bore amplification to 19,050 diameters. The field thus obtained with the $\frac{1}{8}$th, over seven inches in diameter, was absolutely flat. I send you herewith albumen prints of both sets of pictures. You will observe that the small pictures with the $\frac{1}{50}$th are the sharpest, owing, in our opinion, to somewhat better chemistry in making the negative, while, of the enlargements, that from the $\frac{1}{8}$th picture is best, owing to the greater flatness of the field in the original negative.

Without going into a discussion of the comparative merits of Powell and Lealand's $\frac{1}{50}$th in this place, it is interesting to observe that these photographs confirm the opinion expressed by Prof. Rood in this Journal* as to the circular nature of the markings on *Pleurosigma angulatum,* an opinion which had previously been expressed by Mr. Wenham.

At the date of publication of Circular No. 6, Surgeon-General's Office, both Dr. Curtis and myself believed these markings to be hexagonal, as was stated and figured on page 148 of that work. The greater power now obtained has corrected this opinion; but it is worthy of note that in the present pictures the markings appear hexagonal in both the small ones, if viewed with the eye at the visual distance, while on close inspection, or with a lens, they are seen to be circular. In the pictures with 19,050 diameters the circular shape of the markings is very plain; but if viewed from a considerable distance, or with a concave lens, they appear hexagonal. I also send you herewith a photograph of cartilage magnified 370 diameters, in illustration of the results attainable in the photography of the soft tissues. This picture shows capsules, corpuscles, and nuclei, with the utmost sharpness.

In short, it is our opinion that henceforward photography is indispensable to the proper representation of microscopic objects, and is, as practiced in the Army Medical Museum, even in its present condition, adequate to the satisfactory representation of all microscopic objects that do not depend for their value on colors.

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* On the evidence furnished by Photography as to the nature of the markings on the Pleurosigma angulatum, by Prof. O. N. Rood, this Journal, vol. xxxii. p. 335.

PERISCOPE OF MEDICAL AND GENERAL SCIENCE IN THEIR RELATIONS TO DENTISTRY.

BY GEO. J. ZIEGLER, M.D.

"*Temperaments; their Influence upon Mentality and Disease in general.* By PROF. A. P. DUTCHER, M.D., of Cleveland, Ohio.—The doctrine of the temperaments, or *crases*, was taught at a very early period of medical history. Hippocrates appears to have been the first who described them in order, and gave them an enduring place on the page of medical science. He supposed that the condition of the animal frame was chiefly influenced by the nature and proportion of its radical fluids, at least far more so than by those of its solids. The radical fluids he conceived to be four, the elementary materials of which were furnished by the stomach, as the common receptacle of the food; but each of which is dependent upon a peculiar organ for its specific production or secretion. Thus, the *bilious temperament* he apprehended to be caused by a surplus of yellow bile, and dependent on the action of the liver; the *melancholic temperament*, by a surplus of black bile, and dependent upon the action of the spleen; the *sanguineous temperament*, by a surplus of blood, and dependent upon the action of the heart; and the *phlegmatic temperament*, by a surplus of lymph, or fine watery fluid, dependent upon the action of the brain.

"This classification of the various temperaments has been in favor with physiologists until almost the present hour. Notwithstanding all the changes that have taken place in the sciences of physiology and anatomy, it is still the great foundation upon which alone we must build our system of the human temperaments. And when we use the word temperament we desire to be understood as simply speaking of the constitutional differences between individuals, or the differences that are observed between men, which are dependent upon the relative predominance in each, of their organic system. For all practical purposes, the various temperaments may then be classed as follows: 1st, the lymphatic; 2d, the sanguine; 3d, the nervous; and 4th, the bilious. We shall describe each of these temperaments particularly for two reasons: *first*, because they are very imperfectly described by our standard writers on the principles and practice of medicine; and *second*, because an accurate knowledge of them is useful in making out a diagnosis and prognosis of nearly every case of disease that you may be called upon to treat.

"I. *The Lymphatic Temperament.*—On a careful inspection of the physical conformation of those who possess this temperament, you will find that the proportion of fluids is too considerable for the solids, or, in other words, the excretory system, which separates them from the great mass of the blood, is in special activity, and the result is that the body obtains an increased bulk from the repletion of the cellular tissues. Hence the fleshy parts are soft, and the temperament is one of comparative dullness, inactivity, and debility.

"Of those who possess this temperament, the stature is rarely lofty or athletic. The complexion is light; but, instead of being delicately or brilliantly fair, its whiteness is dull and deadlike, indicating a deficiency of the red corpuscles in the blood, and a languid and scanty circulation

of the blood through the skin. The eyes are usually blue, but sometimes gray and hazel; the hair is light, soft, and sometimes flowing; the expression of the countenance is deficient alike in vivacity and strength; the movements of the body are slow and ungraceful.

"Individuals of the lymphatic temperament seldom accomplish much in this driving world of ours. They lack constitutional vigor, which is universally attended with a want of mental vivacity and power. But it would be incorrect to attribute intellectual imbecility and apathy as belonging exclusively to this temperament, for where the sensitive apparatus is well developed in the individual, they sometimes possess as great energy of the intellectual faculties as persons of the other constitutions, and may be endowed with very strong passions. But strength is wanting to enable them to turn these faculties to a useful account; intellectual labor wearies them, and the indulgence of the passions destroys them.

"This temperament is not unfrequently found very marked in childhood, even in those whose antecedents would lead us to predict for them a full and predominating measure of some one or more of the other constitutions. The continuation of this temperament in such is generally limited by the age of puberty, when it is almost imperceptibly merged into some of the other habits. Again, there are others, in whom a strong predisposition to this temperament is inherent and in whom it ultimately predominates. Let these same persons, thus predisposed, pass an active and stirring childhood and youth, and a busy active manhood, and this temperament will remain latent and undeveloped until the approaching weaknesses and infirmities of age cause them to relax in their efforts for gain, to live more at ease upon the earnings of their earlier years, and to pay more attention to the demands of their failing physical frames, then the temperament becomes fully developed, and the individual assumes the magnitudes and dimensions of a modern London alderman.

"But when a young person, predisposed to this temperament, gratifies it in its demands for ease and indolence, and at the same time places no check upon his appetite, but eats, drinks, sleeps, and is merry; avoids active exercise as much as possible, and cherishes his ease-loving and indolent propensities; becomes gross, fat, and sensual; he may expect to reap as a harvest for his indulgence, among other things, a sensual and groveling mind, incapable of high mental emotions, or long-continued exertions, a gross, unsightly, and unwieldy body, keenly alive to the slightest changes of temperature, exceedingly predisposed to attacks of gout, rheumatism, asthma, fever, apoplexy, cancer, and tuberculosis.

"Persons of this temperament are poor subjects for surgical operations. Indeed, all grave injuries and maladies sweep them off with the besom of destruction. They appear to have no vitality to resist the ravages of disease. They speedily succumb to cholera, typhoid fever, diphtheria, and scarlatina. In the two first diseases, I never look for the patient's recovery, if he be a subject of the lymphatic temperament; in the two latter they may sometimes, but I never make a favorable prognosis. Several years since, I was invited by the lamented Dr. W. Cochran, of Darlington, Beaver County, Pa., to see some patients of his, suffering with scarlatina. We entered one house where three little children were afflicted with the disease. After we had examined the patients and retired, the doctor appeared quite astonished when I told him I thought he would lose them all, for he considered them the most favorable cases he had under treatment. They were all of a highly lymphatic temperament. My prognosis was correct.

"Individuals of this temperament are peculiarly obnoxious to pyæmia. Their blood appears to be so wanting in vitality that the slightest cause will sometimes render it so purulent that it is unfit to carry on the healthy nutrition of the various tissues of the body. Hence the prick of a needle, the scratch of a pin, or the sting of a bee, which in other persons only produce momentary inconvenience, may in this state of the system induce fatal consequences. The reparative process is very feeble in individuals of this temperament, and when they do not succumb to the primary shock of an extensive injury or a capital surgical operation, they subsequently perish from the want of power in the system to heal such mutations. In making out the prognosis of any disease, we would always do well not to leave out of our account the patient's temperament.

"II. *The Sanguine Temperament.*—This temperament differs very widely from that first described. All here is life and activity. The complexion is fair and ruddy; the skin is amply supplied with good blood; the eyes are commonly gray, blue, or light hazel; the hair is yellowish, flaxen, or auburn, and sometimes sandy and red; the countenance is usually sprightly and cheerful; the temper, though varied, is rarely ever gloomy, dull, or morose. All things are in the spring-time to it. A fullness of life, with something of levity and thoughtlessness, rather than strength and steadiness, characterizes this temperament. Persons possessing it are seldom masterly or profound; they are pleasant companions, but are better fitted to accompany or follow and execute than to lead and command.

"Notwithstanding persons of this temperament usually want mental daring, yet among them may be found individuals of the greatest perfection of body to which man ever attains. But as in this world our Creator has wisely set one thing over against another, so he has made the most perfect machinery most subject to derangement. This temperament strongly predisposes to all inflammatory diseases and hæmorrhages, such as epistaxis, hæmoptysis, hæmatemesis, and hæmaturesis.

"The sanguine temperament is not commonly fully developed till the system closely approaches, or, in fact, arrives at maturity; for, previous to that time, the blood goes to the nourishment and growth of the body; but after this, there being not so great consumption of the vital fluid, it may accumulate in the blood-vessels and produce annoying and fatal congestions. If an individual of this temperament indulges freely in the pleasures of the table, and uses alcoholic stimulants freely, he may expect to suffer some acute disease or die suddenly with some complicated brain trouble; and if this temperament is combined with the nervous, which renders an individual irritable and irascible, his danger is manyfold increased. Persons thus constituted, seldom live to old age, being cut off by their own imprudence, or by the turbulence of their own passions, in the vigor of manhood.

"But we sometimes meet with individuals who have a temperament directly the opposite of this. It has been called by some writers the *ex-sanguine* or *anæmic* temperament. They have the general physical formation of body that belongs to the sanguineous temperament; but their vital forces are so feeble, and their digestive organs so weak, that blood is not elaborated in sufficient quantities to supply the wants of the various organs of the body. Hence the flesh is thin, the muscles are soft, the skin pale and ash colored; all prolonged exercise of body or mind is insupportable. This class of persons are only possessed of some

energy during their youth; they are unfit for the arduous duties of life; they wither prematurely; and if they are so unfortunate as to marry and become parents, their children commonly die in infancy, or are raised with extreme difficulty.

"It is to individuals of this temperament that pulmonary tuberculosis proves so fatal. In the country we seldom meet with persons of this temperament. It is in large towns and cities where it most abounds, particularly where the sanitary conditions of the people are neglected and vice prevails. The remedy for this is to change as far as possible the individual's surroundings, adopt the anti-starvation system of living; and instead of an abstemious diet, let it be rather profuse than otherwise. In fact, a plan of living directly the reverse of what would be proper for the sanguineous, practiced with liberality, and carried far enough to meet the entire wants of the case, is the one indicated by sound philosophy.

"III. *The Nervous Temperament.*—This temperament is less definitely marked, and therefore more difficult to describe than either the lymphatic or sanguine. The complexion, instead of being fair, transparent, or ruddy, or white, is light, delicate and pearly. The hair, eyebrows, and eyes, are more frequently dark than light colored. The sensibility is vivid and deep; the looks and expressions have a keenness inclining to intensity. The attention, though capable of rapid transition, is, while directed to anything, unwavering and close, and the movements are generally lively and quick. The frame is rarely of large dimensions, and the person is usually inclined to be spare. The manifestations, both mental and corporeal, bespeak a fitness for rapid and delicate action, rather than for great muscular strength.

"Your observation will soon teach you that this temperament is favorable to thought and feeling. It is, so to speak, a mental intensifier; it develops and renders acute all our mental faculties; it gives to the artisan delicacy and beauty of touch and finish; to the professional man feeling, sympathy, and susceptibility; to the poet restlessness, intensity, and brilliancy; and to the orator vividness, splendor, and refinement of thought, word, and gesture. It is said that Lord Byron possessed this temperament in an exalted degree. His poetry abounds in passages which express the language of this mental intensifier or temperament. Here is one of them:

"'Could I embody and unbosom now
That which is most within me—could I wreak
My thoughts upon expression, and thus throw
Soul, heart, mind, passions, feelings, strong or weak,
All that I have sought and all I seek,
Bear, know, feel, and yet breathe—into one word,
And that one word were LIGHTNING, I would speak!
But as it is, I live and die unheeded,
With a most voiceless thought, sheathing it as a sword!'

"The nervous temperament preponderates very largely in our national character. It gives that quickness and susceptibility to new ideas and impressions which so remarkably distinguish our people from any other on the globe; indeed, it gives us the key to the wonderful progress of our republican institutions. Everything in this country must be done at once, and quickly, there is no time for delay; everything that moves must move with lightning speed. In this there is a striking contrast between the American people and Europeans; in the latter the lymphatic and sanguine temperaments predominate. They are slow and sure.

"Our people are the fastest that have existed on the face of the globe since the beginning of time. This we believe is in a great measure due to the predominance of the nervous temperament. Notwithstanding all our sins, both of omission and commission, civilization is to-day further advanced in the United States than any other country in the world. In many respects it is the oldest nation on earth.

"It is the preponderance of this temperament that gives the American people that peculiar mentality which enables them to comprehend every subject that proposes the advancement of society, and readily to advise means for appropriating the improvement to their own benefit. If you doubt this, look at the improvements that have been made in our mechanical and agricultural implements. Look at the steamboats plowing all our navigable streams; see the canals, railroads, and lightning-wires belting the continent, and even connecting continents—and the country only about two hundred years ago an unbroken wilderness, the abode of the wild and untutored Indian! The great danger is we move too fast, and unless we slacken our speed and become more cautious, we will break down, and fearfully jeopardize the perpetuity and glory of our republican institutions.

"The great rebellion that has just closed was precipitated upon the nation, in a great measure, by the high nervous temperament of the Southern people, particularly their leaders.

"Individuals of this temperament are more prone to acute than chronic diseases. The slighter causes of disease affect them more readily than others. Thus a shock or accident sufficient to cause a trifling illness in the lymphatic, will in them often produce fatal illness. Persons of the nervous temperament are usually more subject to convulsive difficulties than others, and the influence of the habit is also frequently very obvious in the temper, showing itself in petulance, ill nature, and all the petty, rankling passions that agitate the human breast, and renders the individual and all his friends most miserable.

"This peculiar manifestation of the nervous temperament is very unpleasant when encountered, as it often is, in the everyday practice of the physician; and it requires the patience of a saint to keep one's equilibrium, and endure the petulance of those who are often but patients in name. The wonderful sympathy that exists between all the various organs of the body is greatly intensified by this constitution; hence disorders, denominated sympathetic, are more severe in this temperament, and assume almost a Protean form. This is especially the case in *hysteria*, where the most eccentric phenomena are manifested that ever fall to our lot to contemplate. They are, no doubt, many of them due to the predominance and activity of this temperament.

"IV. *The Bilious Temperament.*—This presents a character far different from any that we have described. It can boast of nothing fair or ruddy, soft or delicate; every feature of it is masculine and staunch, and their combination indicates rigidity, sternness, strength, and power. The complexion is brown or olive, according to the influence of climate and exposure; the hair is black, strong, coarse, and sometimes curly and bushy; the eyes are dark and lustrous,* and the expression of the countenance is

* This statement seems too positive, for neither the color of the skin, hair, nor eye is uniform in the same temperament, even in the Caucasian, and much less in the other races of men, or in the lower animals. The constitutional crasis termed temperament is in reality inherent in the embryonic plasma, and is not so distinctively marked in the secondary conditions of the body.—Z.

resolute and manly. The person, though never full in flesh, is highly muscular; the stature is rather tall, and the frame is close built and sinewy.

"The temper of individuals of this temperament is commonly abrupt, impetuous, and violent. When their mental organs are large and well formed, they manifest great vigor in the conception of a project, steadiness and inflexibility in pursuing it, and indefatigable perseverance in its execution. It is to this temperament we are to refer the men who at different periods of time have seized the government of the world; hurried forward by courage, audacity, and activity, they have signalized themselves by great virtues or by great crimes, and become the terror or the admiration of the world.

"Persons of this temperament are very liable to suffer from derangements of the biliary organs, such as congestion, inflammation, and fluxes, which produce indigestion, with frequent eructations, acid bilious flatus, and great depression of spirits. A decided bilious habit was so intimately associated with sadness that ancient authors called it the melancholic temperament. There cannot be the least doubt but a deranged condition of the biliary functions is almost always associated with low spirits or hypochondria, and each has, in its turn, been assigned as the cause of the other.

"The symptoms between the digestive apparatus (including the biliary organs—the liver) and the brain are so intimate, that there is often an impossibility of deciding which is primarily affected; still the result is the same: namely, melancholy, hypochondria or depression of spirits. Insanity is more intimately associated with this temperament than any of the others, and, being in a great measure hereditary, it may be transmitted to the remotest generations, unless the succession is interrupted by intermarriages.

"In studying the temperaments as now described, you will not always find the line of demarkation so very clear in all cases, or the distinctive and peculiar features so prominent. On the contrary, they are so blended and combined that they form a compound temperament—a union of two or more, with characteristics proper to each. Thus the sanguine may combine with the lymphatic, forming the lymphatico-sanguineous temperament, very properly called by some the vital temperament. Individuals who have it, are throughout their life loaded with blood and lymph; their body is soft and awkward in its movements, though possessing strength and heat; their viscera are always engorged; their mucous membranes secrete freely; and their lymphatic ganglions are more defined than in the other temperaments. This is the most usual temperament of children, and among adults of women, who recede less than men from the physical characteristics of early life.

"Again, the nervous temperament may be associated with the sanguine, forming the nervo-sanguineous temperament, but it is more commonly joined with the bilious. A combination of the temperaments is more difficult to deal with, when disease occurs, where the features of each are well marked, than when only one exists—just as the offspring of the lion and tiger is the most ferocious and untamable of all beasts, uniting the savage ferocity of the one with the strength and royal independence of the other."—(*Med. and Surg. Reporter.*)

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"*Cell Formation, a Chemical Theory of.*—DR. C. MONTGOMERY has written a very remarkable paper, read before the Royal Society, December 20, 1866, on the above subject. The whole paper has a very particular interest, and his facts are well worth verifying by all who have an opportunity of doing so. From preliminary observations rationally treated, the above gentleman made the following experiments: A viscid substance was required, and myeline, after a long search, was found to be the one. When to myeline in its *dry amorphous* state water was added, slender tubes were seen to shoot forth from all free margins, 'being sometimes wonderfully like nerve *tubes* in appearance, flexible and plastic.' From this crystallization was inferred, and this extension was prevented by an intimate admixture with the white of an egg; clear globules resulted from imbibition by a viscid substance. By further extensions of this observation and similar ones, globules with lively molecular movement were found. A typical cell with nucleus, and even nucleolus, and 'the white margin so often mistaken for a cell wall, was always present.' This latter fact will be a decisive answer to Mohl's theories. Mother cells were formed. Lastly, globules were obtained with another inclosed smaller globule, and this was sometimes multiple, like the typical pus cell. If, instead of water, serum be added to the thinly-spread myeline, bi-concave disks will form, only generally much larger than blood corpuscles. The changes in theory effected by these precise facts will, of course, be very great. The author observes that 'cells' being thus merely the physical result of chemical changes, they can no longer afford a last retreat to those specific forces called vital. Physiology must aim at being something more than the study of the functions of a variety of ultimate organic units."—(*Chem. News.*)

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Sympathetic Irritation. "*Cases Illustrating the Occasional Connection between Neuralgia of the Dental Nerves and Amaurosis.*—MR. J. HUTCHINSON compares certain cases of amaurosis with infantile paralysis. He says: 'Certain cases of amaurosis appear to me to bear a very close resemblance to infantile paralysis. Without any warning whatever, without any other cerebral symptoms, a patient loses the sight of one eye; now and then, but only very rarely, of both. In some cases there is a certain amount of improvement afterward, but often the amaurosis is total and permanent. In some instances the optic disk becomes white and atrophic, but in others it retains an almost normal vascular supply. Most of the subjects of those cases which have come under my notice are women. In some there is evidence of cardiac disease, but in others there is not, and in most I have found the arteria centralis of good size; so that the hypothesis of embolism seems to have but little support. In several of the best-marked cases that I have seen, there was the history of neuralgia in the face for long periods before the amaurosis, the neuralgia being usually connected with toothache. I am quite alive to some of the sources of mistake which attend the attempt to prove the occurrence of paralysis from reflex irritation consequent on a peripheral cause. Chief among them we have, of course, the possibility that the neuralgia itself may have been due to central disease, and that the extension of the latter may have implicated other nerves. I must leave the following cases to make their own impression on the mind of the reader. While endeavoring to avoid forming hasty opinions, I may still venture the practical remark, that I believe we pay far too little attention to the state of

the teeth as possibly productive of disturbances of function, or of nutrition in the eyeball, or even in the cerebral centres of vision. . . . In the case of adults, it is surely the duty of our profession to take every opportunity of spreading information as to possible ill-consequences of retaining stumps in the jaw.'"—(*Ophthalmic Review*, Oct. 1866, from *Ophthalmic Hospital Reports*, and *Amer. Jour. Med. Sciences.*)

"*Injurious Effects of the Heat Rays on the Eyes; Modifications in Telescopes, etc.* — Our contemporary, 'Cosmos' (p. 275), describes a modification which might be adopted in telescopes, and even microscopes, with advantage—the calorific or heat rays being extremely dangerous when viewing such bodies as the sun. M. Foucault proposes to take advantage of certain properties possessed by certain metals of arresting the calorific rays, and of letting the luminous rays pass. Silver deposited by chemical process possesses this property in a high degree. The objective of the telescope is covered with a layer of this metal. The editor of 'Cosmos' says that you obtain, by the use of such an instrument, an image perfectly clear, agreeable to the eye, and one which produces no fatigue. The image is exactly similar to what you would obtain by the use of a violet glass."—(*Med. Press and Circular* and *Med. News.*)

"*Treatment of Wounds by Ventilation.* By M. B. BERRENGER FERAUD. —This method of treating wounds consists in leaving small wounds exposed to the air, and in acting upon larger ones by means of the domestic bellows for a period varying from five to twenty minutes every two, three, or four hours, according to the amount of discharge and moisture that may be present. The object is to secure the formation of a crust over the surface of the wound, under which cicatrization takes place far more rapidly than when the surface is not so protected; and the applications must be sufficiently frequent and prolonged to maintain this crust of a certain thickness. When the crust acquires a degree of rigidity, however, it must be displaced and another formed; and, when the discharge is very abundant, the alcoholic dressings, now so much in vogue in the Paris hospitals, should for awhile precede the ventilation. The influence of this last in improving the condition of the wounds is almost immediate, a disposition to cicatrize and a diminution of the discharge soon being apparent.

"This mode of treatment, according to its originator, M. Bouisson, of Montpellier, may determine sedative, astringent, siccative, antiseptic, and tonic action; but it is by no means indicated in all kinds of wounds, and especially in those whose depth is great in proportion to their superficial extent. Thus, it is not fitted for penetrating wounds, as those of a fistulous character, or characterized by anfractuosities. Abundant suppuration is a further contraindication, except, indeed, when this is due to a mere hypersecretion dependent upon local or general atony or perverted nutrition, and to the lessening of which alcoholic dressings supply a useful preliminary to the employment of ventilation. In slight burns other means may be preferable, as of more convenient application; but in those of the second and third degree, arrived at the stage of a simple denuded wound, ventilation may advantageously supersede cotton and other impermeable applications. In resorting to this means for ulcers, we have to attend to the constitutional cause of these, as well as to render them by various local applications apt for cicatrization before we resort to ventilation.

"Among the secondary advantages of this mode of treatment may be mentioned its simplicity, its easy applicability by the patient or his friends, its economy and its cleanliness. It substitutes a dry for a moist surface, diminishes the chances of septic decomposition, and lessens the chances of infection of the surrounding atmosphere."—(*Bulletin de Thérapeutique, British and Foreign Medico-Chirurgical Review*, and *Half-Yearly Abstract of Med Sci.*)

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Local Anæsthesia.—"In a recent number of the *Gazette Hebdomadaire*, of Paris, is a curious statement bearing on this subject. Two French surgeons, taking the hint from the common practice of placing cotton wet with narcotic liniments in the external ear as a remedy for toothache, determined to try the effects of local anæsthesia in that region as a means of preventing pain in the extraction of teeth. They directed the ether spray upon the track of the trifacial nerve in thirty-two operations of that kind; in twenty-four of them the extraction was painless, in five it was painful, and in three the result was doubtful. Among the successful cases were five superior molars, and one superior canine, which had been broken off previously. Among the failures were three superior molars and one inferior canine. It appeared necessary to continue the projection of the ether three minutes. A shorter time than this was apt to lead to failure. In one case the tonsil was removed after the application of the ether to the auditory meatus. The patient was a young man, highly intelligent, who did not feel a particle of pain. The reader perceives that the time required to produce anæsthesia by external application is much greater than by direct action; but, to offset this, we have the greater inconvenience of the application within the mouth, and the risk of unpleasant consequences from inhaling and swallowing the ether. There is no doubt that Rhigolene would act more promptly. The subject should claim the earnest attention of dental surgeons. It is time chloroform was entirely discarded in operations on the teeth."—(*Pacific Med. and Surg. Journ.*)

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"*Local Anæsthesia.*—Mr. Gay showed lately at the *Great Northern Hospital* an instrument which had been made at his suggestion by Messrs. Warner and Knight, for producing local anæsthesia by means of methylated spirit of higher specific gravity, and therefore less expensive and dangerous than that ordinarily used. Its principle is this: The air, from a bellows worked by the foot, passes through two tubes. One of these is connected with the bottle of spirit by means of another to which it is jointed so as to produce a spray after the manner of the 'scent spray producers' commonly sold in the shops. While this is distributing the spirit over the part to be frozen, a current of air issuing from the other tube produces such rapid evaporation that freezing is almost instantaneous. Common methylated ether at two shillings per pint is employed."—(*Lancet.*)

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Extraction of Teeth without leave unlawful.—"*Legal Proceedings against a Dentist.* At Marlborough Street Police Court last week, Mr. Eskell, dentist, No. 13 Tichborne Street, was summoned for assaulting Mrs. Celia Brown. The complainant said she saw Mr. Eskell's advertisement in the newspapers, and went to his shop in Tichborne Street, accompanied by a female friend, for the purpose of asking him what his

terms would be to put in three or four teeth. She desired to ascertain the terms first, because the advertisement stated that the charge for a tooth was 2*s.* 6*d.* The defendant asked her to sit down on a chair. She did so, telling him that nothing must be done until the terms were settled. The defendant said he only wanted to look into her mouth. She rose from the chair after the inspection, and was then induced to seat herself again. The defendant then, without saying a word, pulled out one of her front teeth. She did not want that tooth pulled out, as it was a good sound tooth. For Mr. Eskell it was represented that 'he had done all he could for the advantage of the complainant.' The magistrate said he was not inclined to regard the pulling out a tooth without the owner's leave as a trifling matter. If the defendant chose to settle with the complainant, he might do so; otherwise he should fine him 20*s.* The defendant came to an arrangement with the complainant."—(*Medical Times and Gazette.*)

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Bad Dentistry.—"A responsible position in society is occupied by the dentist. At the present day, we have a right to expect that every man pursuing the vocation shall be an educated man: that is, that he shall have what we ordinarily term a fair 'preliminary education,' and in addition, and as more directly connected with his pursuit, a reasonable acquaintance with chemistry, anatomy (more especially the local anatomy of the face), physiology, and the principles of medicine and surgery. If he falls short of such qualifications, no matter how quickly he can extract a tooth, nor how durably he can fill one; no matter how glibly he can talk of incisors, molars, bicuspids, etc., etc., he is a charlatan. Just as the deficient doctor of medicine should stand condemned before the world, so should such a so-called dentist.

"We are led to these remarks by reflecting on some grave conditions we have witnessed, a few of which we cite as illustrative of the importance of the proposition above advanced.

"A few years before the war we were seated in the office of the House Surgeon of the Charity Hospital, when a woman walked in with a card asking relief for her. She could not speak, and it was evident at a glance that she was the subject of double dislocation of the jaw. She was seated in a chair, and the dislocation was promptly reduced. Immediately she began pouring forth such a torrent of words as we have seldom heard—the burden of the same being that she had, four days before, placed herself in the hands of a dentist to have some molars on each side plugged; that he had applied great power in filling; that she had felt something give way on each side as he pressed; that she found herself in the condition from which we had just relieved her immediately on rising from the dental chair; that she had tried to make the dentist understand that something was wrong; that he assured her it was only the stiffness of the muscles which so commonly ensues on keeping the mouth open for a long time under dental operations, and that it would soon pass off; that she had returned to him day after day complaining, and that he had as often renewed this latter declaration. She named the dentist, and if ever a man had the heartfelt curses of a fellow human being, that dentist had when we placed her in a condition to wag her tongue. The picture altogether, from her entrance into the room to her exit, was one which fixes itself forever on the mind.

"Comment is unnecessary.

"Recently it has been our lot to encounter another, and a far more serious blunder in a dental point of view. A gentleman, the head of a family, physically very frail, with teeth in bad condition, applied to a dentist to supply him some artificial teeth. As precedent and preparatory, the dentist placed him in the chair, administered an anæsthetic, and extracted *nine* teeth—no inquiry being made as to his habits, constitutional vigor, present state of health, etc. etc. The teeth were very firmly set, and considerable pieces of alveolar process came with several of them. He bled profusely after the operation. That night bleeding was renewed, next day we were sent for, and for one week, night and day, it was a struggle to keep that man from sinking under hæmorrhage; and the torture necessarily entailed by remedial measures can only be described by himself. As for complete recovery, we know enough of his physical, or rather his physiological frailty to feel assured that months will be consumed in reinstating him.

"Now, we ask, where is the common sense in extracting *nine* teeth at one sitting? Surely it will not be contended for a moment that there is a *necessity* for such a proceeding. The want of false teeth can never be so imperatively immediate, that all have to be extracted at once. Important surgical operations, involving greater risks, are often forced on us in their immediate completeness, but nobody can ever, surgically speaking, be thus forced on the dentist.

"A lady friend tells us of a dentist having set a tooth on a pivot for her mother. Great force was used. She was a delicate female. In a day or two, consequent upon the irritation, which was extreme, tetanus supervened, and death ensued.

"Some years ago we were called to a case of premature labor, distinctly induced by extraction of a tooth by a dentist. The female was of delicate constitution; the tooth was removed preparatory to insertion of a false one—simply to improve the appearance,—and with most disagreeable results.

"We knew intimately a lady who suffered from facial neuralgia. She had fine teeth, but she conceived the idea that the neuralgia was founded in one or more of them. She went to a prominent dentist and told him to pull them out and make her a false set. He extracted *eighteen sound teeth* at one sitting. She was a long time recovering from the shock, and to the day of her ultimate death she could only wear his artificial teeth in her pocket. We remonstrated against his extraordinary action, and his reply was, that it was the desire of the lady he had complied with, and that he had no right to refuse to pull her teeth; that if he had not pulled them, some other dentist would.

"Such are a few illustrations of what must be regarded as the result of the grossest ignorance, or worse. We have but one motive in touching the subject, and that must be evident to every honest mind. To these only we appeal."*—(*Southern Journal of the Med. Sciences.*)

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"*On Fractures of the Superior Maxilla.*—DR. GUERIN discusses this subject in reference to the displacement or not of the fractured bone, and he suggests a new method of distinguishing the fracture when displacement has not taken place. He holds that there exists fractures of the superior maxilla without displacement, and that in such cases mobility

* While certainly discreditable, it is apparent that the above is exceptional practice and opposed to the present teachings of dentistry.—Z.

and crepitation are difficult to discover. But he considers that pain produced by pressure over the internal plate of the pterygoid apophyses is a pathognomonic sign. He believes also that it is more easy at the end of several days to discover the mobility of these apophyses than of those of the maxilla. Lastly, he states that the ascending apophysis of the palatine bone is necessarily broken, and that he possesses a preparation showing that fracture of the vertical plate of the ethmoid occurs coincidently with fracture of the maxilla and pterygoid apophysis."—(*Archives Générales de Médecine*, Juillet, 1866, and *Half-Yearly Abstract of Med. Sci.*)

"*Cheiloplasty.* Reported by DR. NAPHEYS. Surgical Clinic of Prof. Gross, Jefferson Medical College.—Fanny S., æt. 11. Three years ago, during an attack of typhoid fever, mortification took place in the lower lip, the jaw-bone became necrosed, the teeth dropped out, and a large gap was made in the lower lip. Such a result as this may occur in the low depressed state of the system attendant upon typhoid fever, protracted dysentery, scarlet fever, and other disorders producing a great drain upon the general vitality, in consequence either of the suffering occasioned by the disease, or from the want of nourishment. Under such circumstances mortification takes place very frequently on the lip, in the upper or lower jaw, or both; sometimes in an extremity, in the top of the nose, or in an ear. In some cases such effects are brought about by ptyalism. From its exceeding liability to set up inflammation apt to terminate in this way, mercury is dangerous when exhibited in low conditions of the system.

"In remedying this deformity it will be necessary to dissect up the integuments from the lower jaw for some considerable distance, so as to bring the contiguous surfaces of the gap in apposition with each other. Unfortunately, the tissue around the opening is nodular, and consequently is exceedingly liable to slough, which is the great danger in cases of this kind.

"The child was placed under the influence of chloroform, and the gap closed by sliding flaps forward, the parts being liberated thoroughly from the jaw-bone. The central wound was closed by three interrupted and three twisted sutures, the two lateral wounds being gently closed with the interrupted suture. The chief risk, after the operation, will be from erysipelas. She has been on the use of the tincture of the chloride of iron as a prophylactic."—(*Med. and Surg. Reporter.*)

Closure of Mouth from Gunshot Wound. "Reported by DR. NAPHEYS. Surgical Clinic of Prof. Gross, Jefferson Medical College.—Wm. C., æt. 45. He cannot open his mouth as widely as natural. There are some bands extending from one jaw to the other, the result of gunshot injury, the ball having entered at the angle of the jaw, knocked out a number of teeth, and passed out through the alæ of the nose. There does not appear to be any contraction on the part of the masseter muscle. The bands are quite firm and situated immediately beneath the mucous membrane. They were divided submucously, enabling the patient at once to open the mouth much wider."—(*Ibid.*)

"*Intra-uterine Union of Hare-Lip.*—Mr. Hutchinson had also lately an interesting case of hare-lip, in which partial union had taken place before birth. The infant was about six weeks old, and the fissure had been on the left side only. At the upper part there was an evident scar

left by cicatrization, but the lower part was still open. The palate was not involved.

"Mr. Hutchinson completed the half-finished cure in the usual way.

"In clinical remarks on this case, Mr. Hutchinson stated that the union by cicatrix did every now and then occur during intra-uterine life. He had seen three or four cases in which infants were born with a scar extending through the whole length of the upper lip, exactly in the position left by that of a successful operation. In fact, nothing but the most conclusive testimony of the little patient's friends, and the absence of the scars of the needles, had in these instances removed his incredulity as to the condition being congenital."—(*Medical Press and Circular.*)

"*Improvement of Speech after Operation for Cleft Palate.*—An opportunity occurred for noting the ultimate result, as regards the voice, of a successful operation for cleft palate. The patient was a young woman, on whom Mr. Hutchinson had operated four years ago for a cleft of the whole of the soft and the posterior part of the hard palate. The result had been most satisfactory. All the parts had well united, except a small notch in the end of the uvula, and she considered herself as remarkably improved in distinctness of utterance. She could really talk very well indeed. Many would not have noticed any imperfection. Before the operation her speech was very bad."—(*Ibid.*)

"*Salivary Calculus.*—Dr. Leech thought it might be interesting to exhibit to the Society a salivary calculus which he had recently extracted. Ranula was a common disease, but calculi were not common even of this size. In Wharton's duct they were rare, and in Steno's duct still rarer. The person from whom this specimen was taken was a farmer aged about forty, and of healthy appearance. He came to him (Dr. Leech) on the 12th of December last, stating that for three weeks previously he had had sore throat, and for the last few days had found it difficult to swallow any food. He also said that for some time he had had a swelling under his tongue, but that it gave him very little trouble till the last fortnight. On looking into the man's mouth, he perceived a large tumor under the tongue, pressing that organ upward and backward, and presenting all the appearance of a common ranula; but on examination it was found to be much more dense and inelastic than those tumors usually are, and on pressure there was a very slight oozing from the orifice of the Wharton duct at the right side of a white matter resembling pus. He (Dr. Leech) at once proceeded to lay open the tumor with a sharp bistoury, when the point of the instrument struck against a hard stony body, which immediately revealed the nature of the case, and, after some little difficulty, a calculus about the size of an almond was removed, the top sharp portion being separated from the larger end. The patient got immediate relief, and next day reported himself well. This man had no tartar on his teeth. Dr. Mapother had made an analysis of the calculus, and found it was composed of sixty parts of carbonate of lime, thirty of phosphate of lime, and eight of organic matter. The analysis made from time to time of these calculi differed very much as to the ingredients of which they were composed.

"Mr. E. Hamilton asked whether there was found any trace of sulphocyanide of potassium.

"Dr. Leech said Dr. Mapother informed him that there was no trace of it whatever.

"Dr. Mapother observed that the quantity of the calculus which he examined was very small, not more than two grains and three-tenths, so that his analysis might not be as satisfactory as might be desired. He could find no trace of sulpho-cyanide of potassium. Claude Bernard had never found that salt in saliva except under diseased conditions, when the breath was very foul, and a great deal of tartar on the teeth. Bernard thought it was the result of decomposition; but at all events he had never found it in any healthy young person with clean teeth. Six years ago a patient sent him a calculus larger than that extracted by Dr. Leech, and there was not the slightest trace of carbonate of lime in it; whereas, in this instance, more than one-half of the quantity he examined was carbonate of lime, the remaining ingredients being phosphate of lime and organic matter. The organic matter seemed to be dried mucus, and had the burnt-feather smell when heated.

"Mr. E. Hamilton. As to the statement that sulpho-cyanide of potassium is not a constituent of ordinary saliva, he was prepared to contradict it from his personal experience. He had obtained it in perfectly healthy saliva.

"The president observed that, as there was some doubt as to the analysis, he thought it would be well if a larger portion of the calculus were examined, and the result reported to the Society."—(*Ibid.*)

"*India-Rubber Nipples a Cause of Chronic Aphthous Inflammation.* By M. R. R. (Schmidt's Jahrbucher, B. 7.)—The author observing several very obstinate cases of aphthæ, which he had treated with solution of borax without success, found on a careful inquiry that all the children so affected were being suckled through India-rubber nipples with the nursery bottle. He found on the inner surface of the nipples a white coherent layer, which on a microscopic examination, was found to consist of a fungous growth (oidum albicans). Some of the fungi were also found on the outer surface of the nipple. He considers that these fungi acted continually as a new source of infection to those children already so affected. He found that rinsing with water was not sufficient to detach the fungi, but that the nipples must be turned inside out and rubbed with a brush and warm water. He thinks that horn or bone nipples are far preferable for nursing bottles, as their smoother surface does not as readily afford a place of attachment for the fungus."—(*Southern Jour. of Med. Sci.*)

"*Dry Preservation or Embalming of Animal Substances.* By Dr. Giovani Feireo. (Gazette Lomb., 2, 3, 1865.)—To obtain a good result, three things are necessary. 1st, to preserve it from the action of oxygen, which is the principal agent in the decomposition of animal substances; 2d, to remove the liquids in the different parts; 3d, to transform the solid constituents into a kind of inorganic substance.

"Suppose a piece of muscle or liver is taken; it should first be cleaned with a cloth, and enveloped in another clean cloth. A paste is made of sulphate of lime and alcohol of 36°. This paste is laid on the substance so enrolled, forming a case around it, until the thickness of the casing reaches at least three centimetres. Remove the substance to a dry place, the temperature of which shall be at least 15° Reaumur, and let it remain twenty or thirty days. On removing the casing the piece will be found perfectly dry.

"In embalming a body, the natural form can be kept, but of course it loses some in volume and gets hard."—(*Ibid.*)

Glycerin.—In an interesting article on the medical properties of this substance (*Med. and Surg. Rep.*) DR. J. ADOLPHUS of Hastings, Michigan, states: "It is perfectly neutral and bland, and has the capacity of diffusing itself freely over and through organic matter, incorporating itself between organic molecules, by which it is absorbed and appropriated. All organic substances, from the hardest bone to the finest connective tissue, are penetrated by it, with such diffusive force as to make their minute structure astonishingly transparent. The blood and pus globules, when suspended in glycerin, become quite transparent, and show up their nuclei readily, their cell-walls becoming more thin and transparent, and finally dissolved. Epithelial structure is admirably delineated by its agency; so are the fasciculi of striped muscular fibre. Thin sections of bone, soaked in it, reveal in admirable style its corpuscles. All organic substances, soaked in glycerin, are thoroughly preserved, both as to form, integrity, and softness."

"*Nature of Disinfectants.*—At a recent meeting of the French Academy, M. CHEVREUL made some very interesting remarks on the subject of disinfectants. The French chemist thinks some of our more common disinfectants of very little value. He tabulates his conclusions as follows: 1. Two volumes of sulphuretted hydrogen and one volume of sulphurous acid with vapor give rise to water and sulphur; in other words, two odorous and deleterious substances become converted into two inodorous and harmless ones. 2. Equal volumes of hydrochloric-acid gas and ammonia form a compound which is neutral as to acidity or alkalinity, although the gases remain unaltered. 3. In the reaction of three volumes of chlorine on eight volumes of ammonia, two volumes of the latter are destroyed and six are simply neutralized. 4. There are some substances which *seem* to neutralize the disagreeable smells of organic matter, and which really act in quite a different manner. Phenic acid, according to M. Chevreul's inquiries, when placed in contact with organic matter giving off offensive odors, neither destroys them nor neutralizes them, but, by combining with them and forming a compound incapable of giving off offensive emanations, arrests *putrefaction.*"—(*Lancet.*)

Sulphide of Silicium.—"At the February meeting of the Massachusetts Institute of Technology, MR. FLEURY, of New York, gave a description of the properties of sulphide of silicium and its preparation by the action of sulphur and carbon or quartz or flint; he explained the manufacture of a pure hydrate of silica, a neutral solution of flint or opal in water, resulting from the decomposition of the sulphide of silicium. Mr. Fleury remarked that gold quartz could cheaply be brought from Nova Scotia to Boston, converted into sulphide of silicium, dissolved in water, and all the gold precipitated by specific gravity and forcing of the suspended particles through mercury; that the liquid (the value of which would more than pay for the expense of extracting the gold) mixed with other cheap materials of a proper consistency can, when poured into moulds without application of fire or any heat whatever, form excellent snow-white flint marble statuary, tombstones, ornaments, and building stones, hard enough to resist all the influences of the weather better than natural marble. Mr. Fleury remarked further that the cost of this flint-marble statuary, etc., is less than one-third of that of cut or chiseled marble."—(*Sci. Amer.*)

Metallic Salts reduced by Formic Acid.—In one of his lectures on the "Synthesis of Organic Substances" (*Chem. News*) DR. F. CRACE CALVERT says: "Formic acid has become, like many other organic substances, a curiosity one day, a commercial product the next. It is now manufactured artificially in large quantities, owing to its successful application in the production of those beautiful tar colors, especially blue, to which we have already referred in this lecture. But the application of formic acid, I think, will not be limited; it will extend widely with time, not only because it reduces with great facility metallic salts, especially those of silver—and thus will, no doubt, become in time the means of silvering glass, instead of having to employ the present costly method."

Castor Oil for Leather Belts, etc.—"Castor oil is as useful in the trades as it is as a medicine. It is much better to soften and to redeem old leather than any other oil known. When boots and shoes are greased with it, the oil will not at all interfere with the polishing afterward, as is the case with lard, olive, or any other oil. In Harrisburg, Pennsylvania, the old leather hose of some of the fire companies was greased with it, and it was found to become almost as soft and flexible as new leather. Leather belts for transmitting motion in machinery will usually last three to five years, according to the wear and tear they are exposed to; when greased with castor oil, they will last ten or more, as they always remain flexible and do not crack. Besides this advantage, castor oil will prevent slipping, so that a belt three inches wide impregnated with it will be equal to a belt four and a half inches wide without castor oil. It is necessary, however, to wait twenty-four hours, till the oil has disappeared from the surface and penetrated the leather; otherwise the freshly-greased surface will cause slipping. That rats and other vermin detest anything impregnated with castor oil, and will not touch it, is another advantage."—(*Chemical News.*)

Paraffine to prevent Rusting.—"Pure paraffine is a good preservative for the polished surface of iron and steel. The paraffine should be warmed, rubbed on, and then wiped off with a woolen rag. It will not change the color, whether bright or blue, and will protect the surface better than any varnish."—(*Am. Artisan.*)

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The fact that this work has reached its fourth edition in England and its fifth in this country, is prima facie evidence of its popularity and value. Its treatment of the classification and action of remedies being based upon observation and experience, rather than upon mere abstract reasoning, renders it more attractive and practical. The matter is presented in such a clear, condensed, and comprehensive manner as to constitute a valuable vade mecum, indispensable to all who desire information on the subject. As a standard manual, it should be in the hands of every one interested in the science and art of medicine. The mechanical execution of the work is good, and in the usual neat library style of the publishers.

THE

DENTAL COSMOS.

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ORIGINAL COMMUNICATIONS.

DENTAL EDUCATION.

BY J. H. M'QUILLEN, M.D., D.D.S.,

PROFESSOR OF ANATOMY, PHYSIOLOGY, AND HYGIENE, IN THE PHILADELPHIA DENTAL COLLEGE.

A LITTLE more than a quarter of a century ago a successful effort was made to establish a college for the express purpose of teaching the science and art of dentistry, in a manner calculated to elevate it to the rank of a liberal profession. As year after year rolled by, efforts were made, with varying success, to found institutions of similar character in different sections of the country. Some of these, after an ephemeral and inglorious career, ceased to exist, but the greater number have increased in strength and usefulness. Institutions of learning, as a rule, like individuals and nations, are compelled to enter upon their career with limited means, and whatever may be the aspirations and desires of their founders—with the fullest possible recognition of all that is demanded for the successful accomplishment of the aims and objects in view—stern necessity compels them to accommodate themselves to circumstances, and make the most of their surroundings, with the determination, as time and increase of resources afford the means and power, to do that which it was impossible to effect in the commencement of the undertaking. As the seed laid in the ground, under favoring influences, germinates and produces a thousandfold, so with increase of years, strength, and resources, evidences of growth should be manifested in collegiate institutions by enlarging the curriculum of instruction, increasing the means of illustration, and in every direction affording the fullest opportunity possible for the impartation and acquisition of knowledge.

The trials and difficulties with which the faculty of each institution has had to contend in gaining the confidence and support of the profession, cannot be appreciated by those who have not participated in the struggle

from the beginning, nor can they conceive the more than missionary zeal that is demanded in delivering regular and systematic courses of lectures to classes so small that the prospect of ultimate success appears impossible to any other than enthusiasts. A distinguished writer has said, "It is pleasing to contemplate a manufacture rising gradually from its first mean state by the successive labor of innumerable minds; to consider the first hollow trunk of an oak, in which perhaps the shepherd could scarce venture to cross a brook, swelled with a shower, enlarged at last into a ship of war, attacking fortresses, terrifying nations, setting storms and billows at defiance, and visiting the remotest parts of the globe. And it might contribute to dispose us to a kinder regard for the labors of one another, if we were to consider from what unpromising beginnings the most useful productions of art have probably arisen. Who, when he saw the first sands or ashes, by a casual intensity of heat, melted into a metalline form, rugged with excrescences and clouded with impurities, would have imagined that in this shapeless lump lay concealed so many conveniences of life, as would in time constitute a great part of the happiness of the world? Yet by some such fortuitous liquefaction was mankind taught to procure a body at once in a high degree solid and transparent, which might admit the light of the sun, and exclude the violence of the wind; which might extend the sight of the philosopher to new ranges of existence, and charm him at one time with the unbounded extent of the material creation, and at another with the endless subordination of animal life, and what is yet of more importance, to supply the decays of nature and succor old age with subsidiary sight. Thus was the first artificer in glass employed, though, without his own knowledge and expectation, he was facilitating and prolonging the enjoyment of light, enlarging the avenues of science, and conferring the highest and most lasting pleasures; he was enabling the student to contemplate nature, and the beauty to behold herself."

The origin and establishment of dental colleges have been so recent that ample opportunities have been afforded not only to the profession, but the public at large, to observe their gradual development, by the successive labors of a few active, energetic, and indefatigable minds, and whatever may have been the doubts in the past, the question of the success of the movement is no longer an uncertain one. For during the past session two hundred and seventy-six students were in attendance upon the institutions, and of these students, one hundred and eight graduated as doctors of dental surgery.* And if the course of instruction, and the qualifications for graduation are maintained at a sufficiently elevated standard to command the confidence and respect of the profession, there is no reason why the classes in attendance upon each of the dental col-

* This is exclusive of the honorary and other degrees conferred by some of the institutions.

leges should not in a brief period count by hundreds, instead of tens, even with the more than probable increase of schools. For the profession and the community, recognizing the advantage and importance of a collegiate education, are demanding now in our large cities, as they eventually will in the rural districts, that practitioners of dentistry, like those of medicine, shall be regularly instructed and graduated at some respectable school. When, as at the present time, the artisan is taught in schools of science, the elementary forms of matter, to which his skill is to be applied, and the tiller of the soil is made acquainted in agricultural colleges with the geological structure of his farm; the principles in chemistry, by which he may resuscitate exhausted fields; the organization and habits of plants best adapted to the soil, and of their relations to the meteorology of the climate in which he lives, it ill becomes the practitioner of a liberal profession to be unacquainted with those sciences upon which sound practice alone can rest. That a general knowledge of these sciences may be acquired by persons of studious habits, outside of colleges, with the aid of books, is, beyond a question of doubt, true. Persons of studious habits, however, are rather in the minority than in the majority, not only in the world at large, but also in the dental profession. A general knowledge of anatomy, physiology, chemistry, and the principles and practice of medicine and surgery, such as that which every well educated gentleman possesses, is not sufficient for the practitioner of dentistry, for it is quite as indispensable that he should be as thoroughly acquainted with these sciences as the medical man. The recognition of this fact induced leading men in the profession to seek such knowledge in medical schools, prior to the establishment of dental colleges. The only way to acquire a correct knowledge of anatomy, a pre-eminently demonstrative science, is by reading closely, attending lectures, and above all, dissecting the cadaver. Vivisections are indispensable for a full comprehension of physiology. Chemistry demands the aid of experiments in the laboratory for its elucidation, and the principles of surgery and medicine can only be studied with profit while enjoying the opportunities afforded for examining the various forms of disease, and witnessing the different surgical operations in the clinics of the colleges, or the invaluable hospitals of large cities.

In making this assertion I do not underrate the *capacities* of my fellow-practitioners, who, so far as *natural endowments* are concerned, will bear a favorable comparison with the members of any profession, but it is impossible that they could acquire that knowledge of these sciences which a graduate of a dental college should possess, unless they have enjoyed the advantages referred to. Practitioners and *teachers* who, as *students*, have subjected themselves to the severest ordeal, will admit the correctness of this conclusion, for they know what it *costs to learn.*

Convictions such as these, and the fact of always having opposed the

conferring of degrees upon any others than those who have attended lectures, and passed a satisfactory examination, with the exception of gentlemen who have distinguished themselves as contributors to science, prompted me at the recent meeting of the ASSOCIATION OF THE COLLEGES OF DENTISTRY, to protest, in the name of the institution with which I am connected, and in behalf of the profession and the community whose interest should be dear to every one, against the practice of graduating candidates who may present themselves merely upon years of practice, and without attendance upon lectures. Regarding dental colleges as established for the education of the profession alone, it is easy to understand that the motives prompting a faculty to adopt this course would be to secure the influence of such parties in support of the particular institution with which they would thus become identified, but it is difficult to conceive what advantage can accrue to the recipients of the diplomas, some of whom perhaps in point of general intelligence, and as practitioners, occupy higher positions in the estimation of the profession and the community than those whose indorsement they have sought. Under such circumstances it must be quite evident that the diplomas would be of as little value as the parchment on which they are written.

What is the exact character of the acknowledgment which the faculty of an institution makes when it proposes to graduate those who were engaged in practice, when the institution was established, by merely submitting to an examination? Virtually, that such candidates could learn as much, or more, *outside* of the institution than *in it*, and although such parties have tacitly demonstrated during the intervening years, an utter want of confidence in them, as *instructors*, by avoiding the lecture-rooms of the institution, the said faculty, with a magnanimity worthy of a better cause, are willing to give them as *examiners* an *indorsement* which they do not need.

Cardinal Richelieu's policy of conferring favors, with the expectation of receiving large returns in the future, is a plan whereby a wily diplomatist may secure his ends, but it is little worthy of imitation, on the part of collegiate institutions, whose success should depend not upon the ease with which diplomas can be obtained, but the *thoroughness of the knowledge which is imparted.* If the first plan is the only course by which the support of the profession could be secured, the sooner the doors of dental colleges are closed the better; such, however, is not the case, and the most efficient advocates that an institution can have, are not such as have merely submitted to the ordeal of an examination, and know nothing by personal experience of the instruction imparted, but those graduates who, after enjoying the advantages of months of tuition, under competent and experienced teachers, go forth to the world, and demonstrate by word and by deed, the thoroughness of the training to which they have been subjected, and who, looking back with feelings of gratitude and pride to their Alma Mater, are ever ready to promote her interests.

Every one must honor the spirit which induces practitioners who, not having enjoyed the advantages of a collegiate education at an early period of life, seek such institutions after ten, twelve, sixteen or eighteen years of practice, with the view of securing a more intimate and extended acquaintance with science, and then graduate with the highest honors; but what shall be said of a plan in which the necessity of attending lectures is entirely dispensed with, and the members of the profession are offered diplomas by merely submitting to an examination? No respectable medical college in the country has ever held out such inducements to practitioners of medicine, who are not graduates; and the adoption of such a course on the part of any one of them, would bring down upon it the censure of the profession, and exclude the institution from representation in the American Medical Association.

It is to be regretted that at the very moment when the success of dental education is placed beyond a peradventure, and when Harvard University is on the eve of establishing a Dental School in connection with that time-honored institution of learning, that such a course should be continued; but as will be found by the report of the proceedings of the Association of the Colleges of Dentistry in another part of this magazine, four of the colleges represented at the meeting are emphatically and decidedly opposed to the conferring of such degrees in the future. They have agreed upon certain regulations relative to the education of dental students, which are submitted to the consideration of the profession. This compact will be rigidly adhered to on their part, and although it may not at first meet with the hearty support of the profession, yet, satisfied that their cause is a just one, rather than abandon the position assumed, they would regard failure more glorious than success under such circumstances.

RESULTS OF PULP TREATMENT.

BY HENRY S. CHASE, M.D., D.D.S., IOWA CITY, IOWA.

SINCE my last report in the DENTAL COSMOS (not quite a year ago), I have *destroyed and removed* the pulps of and *plugged* 92 teeth: namely, 25 upper molars, 26 under ditto, 21 upper bicusp., 8 under ditto, 5 upper canines, 7 upper incis. Of the molars, 8 were *under wisdom*, and 2 upper wisdom teeth.

The *root vessels* in none of the molars or bicuspids were attempted to be removed. Those of the palatine roots were removed if dead; if not, they were left alone. No attempt was made to remove the root vessels of lower teeth. In most cases I found the root vessels alive when I plugged the tooth. The central pulp was invariably removed. Arsenic was applied 24 hours, the pulp removed if dead, and the cavity filled with a *saturated tincture* of the sulphate of tannin, and sealed up with cotton wet in sandarac varnish.

Arsenic caused pain in 20 cases from half an hour to three hours each. In 10 cases it was applied twice; in 4 cases, three times; 78 cases, once. In one week after removal of the pulps the teeth were plugged. There were 2 cases of slight pericementitis, and 2 somewhat severe, all cured within 8 hours by mercurius vivus, third decimal preparation. One was a lat. incis., 2 upper mols., 1 bicusp. None suppurated; none extracted.

Besides the above, I plugged 13 teeth of which the pulps were dead from ordinary exposure and inflammation. Three of these had pericementitis, two were cured under the use of mercury, and one suppurated, but was not extracted. Also, not included in the above, are 12 pivot teeth, some on pulpless roots, and some on those which I had removed. Suppuration in no case followed. I treat pulpless teeth with sulphate of tannin a week, just as I do those of which I destroy the pulps.

And now I wish to say what I have so many times said before, that "mercurius vivus" is a specific cure for periostitis, peridentitis, pericementitis. I use the third decimal trituration. One or two grains should be given every hour until the case is better. From three to eight doses cures generally. A failure does not occur in my practice more than once in twenty times, if I see the cases *before* suppuration. My case-book proves this.

DENTITION; ITS PATHOLOGICAL AND THERAPEUTIC INDICATIONS.

BY GEO. W. ELLIS, M.D., D.D.S.

LATE PROFESSOR OF OPERATIVE DENTISTRY AND MICROSCOPICAL ANATOMY IN PHILADELPHIA DENTAL COLLEGE.

The immense labor, so fruitfully expended in unmasking the occult phases of normal dentition, has awakened great interest in a subject, which, though deserving much, hitherto received but little attention.

Premising that most of us possess, at least, a general knowledge of these phenomena, I thought it might not prove unprofitable to engage in a survey of the abnormal conditions concomitant therewith, and to ascertain, if possible, the manner in which these detrimental influences are exercised, the results which they produce, and the most efficient measures for their correction.

With regard to the influences of abnormal dentition the best authorities are entirely at variance, one clique going so far as to pronounce it capable of originating diseases from the most simple and benign to the most complicated and malignant, while another observes in it a physiological process liable to acceleration, retardation, or even slight perversion, yet regard it incapable of exercising any extended influence upon distant parts of the economy, at least to any very injurious or alarming extent.

Now, in this, as in any other matter, religious, medical, or social, the truly correct understanding depends upon the abnegation of the extremes

and the selection of a medium position, from which stand-point we are enabled to disinterestedly canvass its merits; pursuing such a course, we are, through a careful scrutiny of all facts presented, compelled to regard those who would find in the perversion of this physiological process the source of every ailment which might manifest itself during this critical period, as attaching to it a very unmerited opprobrium; while we are equally bound to pronounce, in opposition to such as maintain that it is entirely innocent of any influence in occasioning the many affections which, through an impartial investigation, have been so clearly traced to this source as to warrant the bestowal of the title "Diseases of Dentition."

Having taken the ground that, under certain circumstances, dentition may become prolific in the propagation, sustenance, and aggravation of systemic and remote disturbances, I propose to so divide and subdivide the subject as to render it, if possible, clear of comprehension, and to this end will first make a few comments upon dentition in a physiological sense, and afterward consider its pathological bearings, presenting the views of the most reliable authorities, and in connection therewith humbly submitting my own opinions, founded upon the basis of quite an extensive theoretical and practical tuition, of which my interest in this branch of dental surgery induced me to avail myself.

Teething, in the sense which we are now considering, does not encompass all those beautiful and intricate processes concerned in the evolution and development of the germ, but is conventionally restricted to the period when the teeth and surrounding tissues are involved in those mutations designed to liberate the organs from their fibrous coverings, and permit them to so align themselves in the oral cavity as to prove subservient to the purposes of mastication.

This is a part of the developmental course of the body, and takes place, as we have already seen, upon an average, during the first two years of life, beginning at about the fifth, sixth, seventh, or eighth months, and terminating from the twenty-fourth to the thirtieth month, influenced and varied in some instances by the most trivial causes, and in others pertinaciously resisting all deflective influences.

The whole human fabric is wonderfully composed of parts which, although comparatively independent in their origin and functions, still bear allegiance to certain immutable laws which preside over and regulate the harmony of the entire organism; this combination of independence and dependence renders perfection in all parts indispensable to a perfect whole, and he who is cognizant of the intimate association of all parts, through the instrumentality of an instantaneous nervous communication, can readily perceive how an aberration in a minor number may occasion discord in other and remote localities.

Regarding the teeth even as isolated portions of the economy, the interest investing the remarkable phenomena attending their development

is great, yet how much enhanced when we consider their intimate sympathies with the brain, their close relationship to the organs concerned in nutrition, circulation, and, in fact, with all organs and tissues, through the agency of a labyrinthian plexus of nerves which are inservient to the growth, sustenance, harmony, and repair of each alike.

Let us, after becoming impressed with the importance of these organs, inquire the conditions likely to favor their full and normal formation, encourage as far as practicable their existence, and, when deposed, endeavor to reinstate them.

In perfect health there is a regular progress, resulting in complete typical development; when, however, the harmony is once disturbed, a condition of things is established, which will, more or less extensively, unfavorably influence the health of other parts or even of the entire system.

For instance, the bones cannot be perfectly elaborated if the muscles attached thereto are deficient in energy, and vice versa, if the bone be defective in contour and density, it is but reasonable to expect but an imperfect and unhealthy muscular structure.

Enough has been said and written upon the subject to apprise us all of the powerful controlling influences, for good or evil, which the peculiarities of parents entail upon offspring through the medium of the germ and sperm. Why and how such impresses are manifested we cannot say; we are intelligent enough to find them a name "hereditary!" and declaim against the perversion of the marriage rite in perpetuating palpable deformities and indispositions, but beyond the venturing of this advice, I may say, we are yet comparatively helpless in averting these difficulties, and can only strive to palliate and eradicate them through hygienic measures.

Apart from the perpetuation of these unavoidable defects (I say unavoidable, meaning those existing in either parent, and considered beyond correction, as for instance, phthisis, scrofula, cancerous diathesis, etc., etc.), there are other defects hereditarily transmissible, through the false pride which leads to the gratification of various passions, in conformity with the usages of advanced civilization, and, as remarked by Dr. Ashbumer, "the folly of many of the passions in which we now indulge, and the ignorance of the habits to which, in the present state of society, we liberate ourselves, shall be fully understood and allowed, as the causes operating to produce not only deviations from normal structure and consequent misery to individuals, but a tendency in numbers to form diseases that may reverberate upon the community."

One of the most pernicious habits indulged in by females at the present day, and one which the medical community has been so persistently and justly inveighing against, is that of tight lacing; although a hackneyed subject, it loses none of its importance as a baneful practice, nor is it any the less fruitful in establishing disease, perverting the wonderful process of par-

turition, so as to endanger the lives of both mother and child, and entailing upon the living infant constitutional defects which may manifest themselves in one, many, or even all the tissues and organs of the body.

This habit custom has sanctioned from the supposed additional beauty and grace which it imparts to the female figure; and our folly in not only admiring what we condemn, but even indiscreetly giving it stronger and more tangible support, may be expressed by a slight perversion of the original intent of the following lines—

> "Crime oft seen, familiar with its face,
> We first endure, then pity, then embrace."

The human frame is further modeled by the undue exercise of a few parts to the exclusion of others, as entailed in the pursuit of certain trades or occupations, and this alteration of the normal relative influence may induce a permanent deformity or disease.

These and many other causes, either directly or through intervening events, may disarrange the development and growth of the jaws and teeth. Such difficulties lie within the corrective limits of good advice and reformative efforts, and it becomes the province of the dentist and physician to correct the evil more by mental than corporeal treatment, by addressing facts to the mind rather than physic to the stomach.

Transmitted syphilitic taint cannot be overestimated in its pernicious influences upon the development of the jaws and teeth, for we every day witness its footprints in directions where it might seem almost impious to suspect its presence without such palpable proof; yet we are now quite familiar with the dread disease, and conscious that the specific virus does not cease with the parent, but is transmissible to offspring, and through generations, now slumbering, as if to recuperate its powers, and again appearing with redoubled violence. So prevalent and persistent is this scourge that, in England, it has been estimated that out of 88,784 children dying in one year, from all causes, no less than 225 die from syphilis.

The peculiarities of syphilitic poison, secondarily manifested, consist in a catalytic action, arresting the processes of integration and disintegration, or in other words, "nutrition," and in its tertiary forms this dyscrasia is prominently exhibited in the osseous structures, which, seemingly, melt before it as snow before the noonday sun.

That its influences are plainly discernible in retarding or perverting first dentition is undeniable, even when the predispositions are forcibly normal in their tendencies. When, however, the reverse condition exists, the most unimportant acute or chronic disorders are seriously aggravated through its contamination.

Some very interesting statements upon the agency which hereditary syphilis exerts in occasioning derangement of dentition and the development of an inferior type of tooth elements have been published by Mr.

Hutchinson, of London. It is in the permanent teeth, however, where the peculiarities of form, shape, etc., dependent upon these influences, manifest themselves so prominently, the temporary teeth exhibiting such abnormalities to a much less extent, though often presenting a very bad color, coupled with a marked tendency to decay, from being devoid of the protective influences of a perfectly strong and impervious enamel.

Upon such good authority, however, we are informed that, if prior to or during the eruption of the teeth the infant be affected with severe specific stomatitis, the force is more particularly displayed in the upper incisors, although sometimes extending to the lower incisors and even canines; the first indications of the disease are evinced in a dirty or dull brownish appearance of the enamel of the incisors, which soon fall a prey to the ravages of caries, leaving the little one edentulous, as far as these teeth are concerned, until the permanent substitutes are erupted.

Besides these structural deficiencies, both sets of teeth are prematurely cut, and from the arrestation of normal osseous development very irregularly arranged in the jaws, and unless medication, coupled with vigorous hygienic measures, be adopted and persevered in with the object of eradicating the taint at an early date, the permanent set will be doomed to the same disaster, though the destruction may not be so rapid.

Now, from the fact that this affection is so eminently and powerfully perverting and destructive in its influences, we can, of course, appreciate how the extensive implication of the entire process of nuitrition should disorganize so important and active a process as that of dental formation, and it is only surprising that a vitiating force so general does not, at this impressible age, cause the whole economy to succumb.

Of course, from the inordinate prominence of the teeth and surrounding integuments at this period, their ample supply of innervation and circulation to sustain their rapid evolution, the parts are peculiarly sensitive and susceptible of morbid impressions; hence the supervention of any systemic trouble generally results in its determination to these parts, giving rise to the various derangements pertaining to dentition.

From these facts we should infer that not only the teeth but the jaws would receive their share of this unwelcome visitation, and such is truly the case, for, as I have remarked, in the superlative or tertiary form, syphilis expends its virulence upon the osseous structures, and in any derangement of the maxillary bones their dental contents must necessarily sympathize; if limited, it may simply occasion a retardation of dentition, but if more extended, may destroy the germs, and leave the afflicted patient edentulous, besides, when very serious, giving rise to the most dangerous and startling constitutional disturbances.

Here again we cannot but reflect upon the intimate relationship and mutual dependency of each part upon the other, showing that a normal development of the teeth is as essential to the formation of a jaw—per-

fect in structure and contour—as is the proper progression of the maxillary growth to the welfare of the embryonic teeth contained therein.

A knowledge of the train of evils attendant upon syphilitic taint naturally awakens a desire to become acquainted with the prophylactic and curative measures advocated and practiced; of course it seems most rational, under all circumstances, when possible to attack it at the fountain head, or in other words, through the parent, when any contaminating influence of this nature is known to exist. It does not fall within our province, however, to pursue the subject farther in this direction, which is legitimately the field of the general practitioner; besides, it would lead us into a maze of theorizing and controversy upon the pathological bearings of this subject.

(To be continued.)

A PROFESSIONAL TOUR.

BY L. D. SHEPARD, D.D.S., SALEM, MASS.

A TWO weeks' vacation from business has been so full of pleasant experiences, that I feel constrained to give an account of it to the readers of the DENTAL COSMOS. Our party consisted of eight practitioners, from Boston and other parts of New England. The object of all was to attend the college commencements. Four of the number were revisiting the familiar scenes of their professional studies. Three were graduates of the Baltimore Dental College, from which two had been absent thirteen years, and one six years.

After an agreeeble journey, the only noticeable incident of which was a pleasant call on Dr. Atkinson, in New York, whose latch-string, as is well known, is always out, we arrived in Philadelphia, Tuesday noon, Feb. 26.

On Tuesday evening, at the Philadelphia Dental College, we heard a very interesting and lucid lecture by Prof. Garretson, on Carcinoma, and one on Generation, by Prof. McQuillen. On Wednesday Prof. Garretson held a surgical clinic, operating before the class, and removing a cystic tumor from the antrum of the left superior maxilla of a female patient, brought to him from New York.

On Wednesday evening a very fine entertainment, complimentary to the students of the Pennsylvania and Philadelphia Dental Colleges, was given by Dr. S. S. White, in National Hall. There were invited, besides the students, faculty, and trustees of the two colleges, all the dentists of Philadelphia, the faculties of the medical colleges in Philadelphia and of the dental colleges in Baltimore, Cincinnati, and New York, together with all the profession who happened to be sojourning in Philadelphia at the time. Dr. White would have been happy to have seen all his friends throughout the land, but as their number is so great, a line had to be

drawn somewhere. We quote the following from the account published in the *Philadelphia Bulletin:* There were prominent dental surgeons also present from all the principal cities of the Union. A fine band of music enlivened the occasion. His Honor, Mayor McMichael, presided, and the divine blessing upon the social hour was invoked by Bishop Simpson. Dr. White on the Mayor's left, welcomed the guests in cordial terms, and the expected attack was then made upon the luxurious viands.

The desire was to have the various dental and medical schools represented on the occasion, and the following arrangement of sentiments and speakers was designed for that purpose :

1. The Unity of Science the Bond of Fraternity. Bishop Simpson.
2. Necessity of Collegiate Education in the Healing Arts. Prof. W. S. Forbes, Pennsylvania College of Dental Surgery.
3. Dentistry as a Liberal Profession. Prof. C. A. Kingsbury, Philadelphia Dental College.
4. Chemistry as a Basis to Medical Arts. Prof. R. E. Rogers, University of Pennsylvania.
5. Dentistry, Hygienic and Operative, in General Medical Practice. Prof. Ellerslie Wallace, Jefferson Medical College.
6. Specialties in Medicine. Dr. J. Solis Cohen.
7. The Press, a Disseminator of Intelligence. J. L. Ringwalt, Esq.
8. Odontology as a Branch of Zoology. Prof. Joseph Leidy, University of Pennsylvania.
9. Our Professional Co-laborers from abroad. Dr. L. D. Shepard, Mass.
10. Dental Literature. Prof. J. H. McQuillen, Philadelphia Dental College.
11. Recent Progress of Dental Science and Art. Prof. G. T. Barker, Pennsylvania College of Dental Surgery.
12. Contributions of Dentistry to General Medicine. Dr. S. W. Butler, Editor of *The Medical and Surgical Reporter*.

The affair was a handsome success in every sense of the word, and when it finally broke up, every participant was in the best possible humor.

Passing to Baltimore on Thursday morning with two of the party, we found in the evening a most brilliant audience filling the Concordia Opera House, to witness the commencement exercises of the Baltimore College of Dental Surgery, the oldest institution of the kind in the world. The valedictory address was delivered by Dr. Russell Murdock, Prof. of Anatomy, followed by an impromptu address, in answer to the call of the class, by the students' old favorite, Prof. Bond, who has filled the chair of Pathology and Therapeutics, without intermission, since 1840, when the college was chartered. Time has dealt kindly with this old servant, and preserved him after so many years of service, a monument of how correct living and outgushing cheerfulness can retain youthful feelings in the midst of advancing years. His quaint allegorical address, as full of les-

sons of wisdom as of humor, of which no description can do justice, brought vividly into each old graduate's mind pleasant recollections of the genial atmosphere of his lecture-room.

The degree of doctor of dental surgery was conferred by the Dean, Prof. Gorgas, on thirty-one young men, representing eleven States, with one from the District of Columbia, and one from France. The triennial catalogue, just published, very properly classes the regular graduates by themselves, and adds a separate list of the recipients of honorary degrees. From this we find that the whole number of regular graduates during the past twenty-seven years is 410. The college conferred many honorary degrees (about one hundred and fifty) when it was young and the degree an unfamiliar one, but only three such during the past fourteen years. We were pleased that our old Alma Mater, which languished during the war, and was with great difficulty kept in operation, had so soon recovered its prosperity. We can see no reason why this institution, with its many associations inseparably linked with the rise and progress of the profession, the admirable adaptation of its building for the purpose of instructing, and the large extent of country from which it almost exclusively draws the students, should not in the future exert influences for good even greater than in the past, and second to none.

In Philadelphia, on the same evening, a party was given by Prof. Jas. Truman, to the students and friends of the Pennsylvania College of Dental Surgery. Absence from the city prevented our attendance.

On Friday afternoon the Fourth Annual Commencement of the Philadelphia Dental College was held in Musical Fund Hall. Dr. Wardle, Prof. of Mechanical Dentistry, delivered the valedictory address. It was characterized by a high moral tone, and was full of sound advice and practical suggestions. The degrees were conferred by the Rev. Dr. Newton, Pres. of the Board of Trustees, upon thirty gentlemen, representing eleven States, with two from Germany, one from Ireland, and one from New Brunswick. We were struck with the age of the graduates. They were not boys, but almost all looked mature men. Of the thirty graduates, thirteen had been in practice from five to eighteen years each, or together had seen one hundred and twelve years of practice, or an average of over $8\frac{1}{2}$ years each. Of the other seventeen, thirteen had attended a previous course in this college, one a first course in the Pennsylvania Dental College, and the other three, courses of medical lectures in the University of Maryland, New Orleans School of Medicine, and Bowdoin Medical School. There were besides nine who, as far as previous lectures or practice was concerned, were eligible for graduation, of whom four had attended a first course, and five had seen practice five, six, seven, and ten years respectively. These did not come up for examination, some having come in after the 20th of Nov., and some, I suppose, preferring to take the second course. We get all these particulars from the study of

the programme provided at the commencement, which has an admirable feature in giving not only the name and residence of each matriculant, and the subject of the thesis of each graduate, as do other schools, but the names of the preceptor of each matriculant, and whether this is his first course, or if not, where he had attended his first course, or how many years he had practiced.

In the same hall, on Friday evening, was held the Eleventh Annual Commencement of the Pennsylvania College of Dental Surgery. The valedictory address was delivered by Dr. T. L. Buckingham, Professor of Chemistry and Metallurgy. The degree was conferred by Dr. W. W. Fouché, on twenty-six graduates, representing nine States, with three from Cuba, two from Porto Rico, and one from England. The degree was also conferred upon twenty-three gentlemen, from different parts of the country, who had been in practice since 1852, and who had submitted to an examination for the purpose, but had not attended lectures. While some of the gentlemen who received these honorary degrees are personal friends, in whose good fortune we rejoice, and without in the least questioning the motives of the faculty of this college in pursuing this course, we must protest that in our opinion it is a very objectionable plan, and we fear a dangerous one, if adopted by all our colleges. It may prove "not only unnecessary, but detrimental to dental education."

It is very encouraging to notice the increase of students in the two Philadelphia colleges, during the past few years. From the published records in the journals, and the programmes of this year, we compile the following table.

In 1862–3, before the Philadelphia Dental College was chartered, the old college had 41 matriculants and 20 graduates; the record since is as follows:

	PENNSYLVANIA COLLEGE.		PHILADELPHIA COLLEGE.	
Sessions.	Matriculants.	Graduates.	Matriculants.	Graduates.
1863–4	45	17	11	6
1864–5	57	29	26	15
1865–6	66	33	46	15
1866–7	76*	26	70	30

The above statistics seem to demonstrate that those gentlemen who petitioned the Legislature of Pennsylvania, against the establishment of a second dental college in Philadelphia, underrated the progress of the educational movement in the profession, when after stating that "the largest class ever in attendance numbered 63, while the average since the college has been in operation does not exceed 46," closed their remonstrance in the following words:—"several similar colleges in other locali-

* The Pennsylvania College in its list publishes 100 matriculants. In selecting the number above, I have omitted 24 who received diplomas without attending lectures.

ties have suspended for want of adequate support. Such being the case, the establishment of another college in this city will of necessity divide the class, rendering the successful continuance of either impossible, thereby depriving the community of the best method of teaching practical dentistry. Therefore, believing an additional college not only unnecessary, but detrimental to dental education, we submit the above." We reproduce this remonstrance simply to impress the fact that the profession is to-day far more advanced in an educational point of view than the most sanguine a few years since dared to hope. The two schools the last session have each had more matriculants than "the largest class ever in attendance" before 1863. And together, for the past three sessions, have had more *graduates* than the average number of *matriculants* of old, as stated above.

At 9 o'clock on Friday evening, a company of about two hundred sat down to a bountiful entertainment at the rooms of the Philadelphia Dental College, as the guests of Prof. Wardle. The host was supported, on the right by Rev. Dr. Newton, and by Ex-Gov. Pollock on the left. After the inner man was satisfied, the "flow of soul" commenced. Speeches were made by Rev. Dr. Newton, Ex-Gov. Pollock, Prof. D. Hayes Agnew, of the University of Pennsylvania, Profs. Wardle, Garretson, McQuillen, Kingsbury, Ellis, Atkinson, McManus, etc. The press was ably represented by Mr. Wells of the *Bulletin*. The company separated at a late hour, satisfied that the way in which the Philadelphia colleges entertain their students, alumni, and guests, at each annual gathering, is worthy of imitation.

On the following Wednesday evening the New York College of Dentistry celebrated its first anniversary, graduating a class of nine. The Dean, Prof. Kingsley, read a report stating that the number of matriculants this session numbered thirty, and giving a history of the organization and management of the college. Dr. W. W. Allport, of Chicago, delivered the address to the graduating class, inculcating the necessity of industry, economy, honesty, sobriety, and fair dealing as indispensable requisites to the success of all professional men. The degrees were conferred by the venerable President, Prof. Eleazar Parmly, with appropriate words of fatherly advice. Mayor Hoffman made an admirable address, showing true appreciation of the profession. In concluding, he counseled the graduates "to pursue their profession with industry, honesty and temperance, as their guides, and they could not fail of success wherever they might go." The exercises were closed by an address by Prof. Hamilton.

A grand supper was given by the dentists of New York and Brooklyn at the St. James Hotel, on the following Friday evening. It was a success in every sense, and reflects great credit upon the committee who had entire charge. Space does not permit a longer reference to it, nor can I more than refer to the objects of interest visited in Philadelphia, as the

Union League Club House, the hospitals, and the Academy of Natural Sciences, whose museum is very complete in ethnology, having over one thousand skulls from all parts of the world, and whose collection of birds is unsurpassed in this country. In Washington, pleasant hours were spent in the Smithsonian Institute, and with Dr. Woodward of the Army Medical Museum, who, among other highly interesting matters, showed what had been done by Dr. Edward Curtis, U.S.A., in the department of photomicrography. His specimens are beautiful, and inspire the beholder with wonder and admiration at the achievements of science. The result of our visit is a deeper love for and greater confidence in our system of dental collegiate education. We wish the fullest success to each of our colleges. Their influence cannot be estimated. There is room for more. Ere long New England will add her college to the sisterhood. Several thousand are to-day practicing throughout the land, whose first duty and greatest need is the collegiate course, and a large percentage of them will, we trust, soon avail themselves of its advantages. These, with the hundreds just commencing study, will give our college enough material to work upon for years.

The time is near at hand, and God speed the day, when it will be with us, as with our medical brethren, that the only respectable entrance to the profession will be through the regular collegiate course. Many worthy men still are with us, who though not graduates are an honor to the profession. We respect them, and would not utter a word in detraction. Yet we feel that they belong to a generation linked with the past, which is gradually passing away.

REMOVAL OF TEETH FROM VULCANITE PLATES.

BY H. BERHARD, D.D.S., NEW YORK.

In addition to the suggestions heretofore made by some of your correspondents in relation to the removal of teeth from vulcanite plates, permit me to mention one, which, having adopted, I have found to be superior to all other methods, for the reasons that time is saved and the base remains *uninjured.*

Fill the inner portion of the plate with plaster about $\frac{1}{16}$ of an inch higher than the ridge; place the plate on a glass with teeth upward, until plaster is hardened; brush teeth to be removed slightly with oil; heat the anterior points of the teeth in the flame of a spirit-lamp, being careful that the flame does not touch the rubber for about fifteen or twenty seconds; if held sufficiently long, the slightest touch will cause the teeth to fall off, and the plate may be used again. Even without the plaster, I have attained the same result by this method, but the use of plaster is preferable.

PROCEEDINGS OF DENTAL SOCIETIES.

PROCEEDINGS OF THE ODONTOGRAPHIC SOCIETY OF PENNSYLVANIA.

BY THOS. C. STELLWAGEN, D.D.S., A.M.

(Continued from page 491.)

August 25th. When applying the splint considerable difficulty was experienced in getting the jaw into place, owing to the pain and displacement of the fragments; but after placing packthread around the front teeth, and pulling the jaw over to the left, every part went up into the splint, although scarcely as high as they should, the splint being rather tight, because of the improper omission of the two or three coats of silicious varnish usually given to the plaster teeth before packing the soft rubber. The splint was screwed to both canines, on the left side, and to the upper first molar and lower first bicuspid on the right.

August 27th. Swelling and pain lessened very much.

August 28th. All going well; patient wants to know if he may go to work.

August 29th. Parts begin to look natural. Patient sleeps well, except when coughing, through a severe cold.

August 31st. Patient quite comfortable, except when coughing at night. Has begun to work at his trade (glass cutting).

September 5th. Patient has been out in the country to see a sick relative. Removed the splint and cut away some parts pressing too hard on the roof of the mouth. Fractures making fair progress. Took away the right wisdom tooth, it being very loose, as in addition to the loss of one root the tooth had been further loosened by attempts to extract it before the patient went to the dispensary. Replaced the splint.

September 8th. Sensation returning to lower lip, etc. Doing well in every particular. The right back fragment has no tooth to hold it, but the muscles keep it firm against the portion in front.

September 15th. All going on well.

The man was spared much pain by adjusting the casts by the articulator. In fact, it would have been hardly possible to have set the fragments of the bone in place and held them there while taking the impressions and bite, the case being so extremely severe in every particular. All attempts to hold it in place by bandage, even temporarily, were ineffectual.

Case 8.—I applied the wings of Fig. 3 in the case of a distinguished statesman in Washington, whose jaw was fractured on both sides between the bicuspids.

The injury was caused by falling from a carriage, April 5th, 1865. Unsuccessful attempts had been made to hold the jaw in place by bandages, and also with ligatures on the teeth, by the surgeons first called to the case. On the 14th the patient, while asleep, was attacked by an assassin, and a cut inflicted which reached from under the right zygoma to the left of the trachea. Steno's duct was severed, and the right fracture laid open externally, the bone being also much exposed in the mouth from the original injury.

In accordance with letter of April 14th, from Dr. Wm. Whelan, chief of the Naval Bureau of Medicine and Surgery, in answer to one by Sur-

geon Bache, chief of the Naval Laboratory, suggesting the use of an interdental splint, and telegrams of the 15th, urging me to come on at once, I started for Washington, and reached the patient's house at twelve, noon, on April 16th. Attending Surgeon, Basil Norris, U. S. A., informed me that the jaw was fractured on the right side, between the bicuspid teeth, and also in the ramus of same side; that the jaw had been bandaged against the upper gum, but this proving insupportable to the patient the bandages were removed. Upon examination I found discoloration caused by the accident still remaining on the right side of the face. A cut (inflicted in the attempted assassination) commenced under the zygoma, passed forward about three inches, then downward and backward an equal distance, to the lower border of the jaw, from whence it crossed over the front of the throat to the left of the trachea. On the skin its first direction fell somewhat from a horizontal line, the second passed down at a little less than a right angle to the first, while the third went forward and downward. These three divisions, of nearly equal length, appeared to have been made by one sweep of the knife. Across the throat the wound was superficial, but above the border of the jaw it grew deeper, as it *split* the cheek—the point of the knife making no entrance into the mouth, except so far as it may be considered to have done so by laying open the right fracture externally, the gum being already lacerated internally from the great displacement of the bone following upon the original injury. The knife was evidently aimed at the throat, but the head being thrown over (the right arm being useless) the cheek and jaw received the brunt of the blow. No arteries had been ligatured. The wound was neatly sewed up, and healing by first intention, except immediately under the fracture. The swelling and stiffness made the examination difficult, but the ramus proved to be uninjured. There was, however, a second fracture, but on the other side of the mouth, the jaw being fractured on both sides between the bicuspids. The jaw contained all the ten forward teeth. The right wisdom tooth and root of the left were all that remained back of the bicuspids. The part in front, containing eight teeth, was drawn down out of place, while the right back fragment, with the wisdom tooth and second bicuspid, was drawn up, showing its fractured end white and bare. The fracture was square across, vertical and smooth, and the parts were separated vertically over a quarter of an inch when at rest, sometimes much more. On the left side, the first bicuspid fell forward and downward from the second one-quarter of an inch. This fracture passed forward somewhat in descending. Here the bone could not be seen, as the gum had separated from both teeth and lay swollen over it. Pus discharged profusely from both fractures. The gum was pale and flaccid, in keeping with the general condition of the patient. The upper jaw was entirely without teeth. Deeming it important to set the exposed bone in place as early as possible, and also to give the patient time to recuperate—as he had already been subjected, during the morning, not only to a relation of the President's death, but to much that was said and written upon the subject—I obtained the patient's artificial teeth, intending to cut out the front teeth, and tie the lower natural canines to the upper artificial ones. In this way the back fragments would have been kept down in place, and in return would have held the artificial teeth up against the roof of the mouth. They could have been used therefore to support the front of the lower jaw temporarily, without assistance from bandages, which were not only

inadmissible in consequence of the wounds, etc., but would have increased the tendency to necrosis by interfering with the circulation. But the patient's experience with the teeth had not been such as encouraged him that he could bear them in his mouth. It was therefore necessary to leave the parts as they were until the next morning.

In the afternoon, while explaining the treatment proper for the case to Dr. Whelan, I also stated my unwillingness to commence, except with the understanding that I should control it entirely.

April 17th. Was informed by Surgeon Norris, that the friends of the patient were unwilling to have the splint fitted to the jaw at present, and that the surgeons agreed with them.

Upon giving my views to the contrary, Dr. Norris came over to my opinion. I consented to wait until the following morning, when it was finally decided not to proceed in the matter. I protested, in vain, but promised to return when sent for.

April 28th. Arrived in Washington; Surgeon-General Barnes informed me that the jaw was more displaced, but the patient otherwise much improved. I found the sensation of the right side of the forehead, face and lips deficient. The separation of the inferior dental nerve by the displacement of the bone, and of branches of the facial nerve, by the knife, did not seem sufficient to account for it. There was also irregular motion in the right eye. The front of the jaw was lower, and the right back fragment showed its alveolar to a greater extent. There were no indications of any tendency to union on either side. The fragments could be put precisely in place, no splinters or anything else intervening. There was little swelling, but great discharge of pus. Took wax impression of upper jaw, and removed the tartar from lower teeth.

April 29th. I set the jaw, and held it in place by wire and silk ligatures, as described in pp. 4, 5. Took a wax impression of the teeth and gum, and obtained the bite directly from the teeth, etc.*

April 30th. Patient felt much relieved, as the ligatures held the front of the jaw up well. Tried in a gutta-percha splint, arranged the wings in it, removed it carefully from the mouth, placed the upper and lower casts and female screws in it, and set them in a vulcanizing flask.

Although the front of the jaw containing the eight forward teeth was greatly displaced (before the setting), the silk and wire ligatures held well until May 2d, when they were removed and the splint applied. It was of hard, vulcanized rubber, covered the roof of the mouth and adjacent gum, inclosed all the lower teeth, and went down over the gum on the outside somewhat. The opening in front was seven-eighths of an inch wide, and half an inch high in the centre, the wings preventing any more room sideways, as they were set clear of the commissure of the lips. To have given more room in the height, by depressing the lower jaw, would have made it very difficult to prevent the saliva from overflowing at the lips. Upon putting in the splint the breathing was very spasmodic for several minutes, but this soon passed off, and I screwed it fast to the lower teeth. They held it against the upper gum for the first night, but after that a cap, with adjuncts, as in Fig. 3, was worn to support the splint. The upper wings only were used, as the lower jaw was held up in the splint by screws passing into the lower canines. The mental band

* In doing this, and in making the splint, I was assisted by Mr. J. Adams Bishop, who accompanied me from New York.

was consequently not applied, although the lower wings were left on in case of need. The upper wings being kept clear of the zygomas, the parts around the jaw and face were left free from pressure—this being important, in order that the vascular and nervous circulation should be unimpeded. After giving the excellent army nurses who were in attendance upon the patient full direction for keeping the splint clean in the mouth, and properly balanced by the cap, which I had fitted to the head, I left Washington, May 3d.

Arrived in Washington again on the 8th, having received a telegram saying that the patient was suffering much pain. Found him quite comfortable, talking freely, and much encouraged. Saliva had accumluated several times in the cheek, but had been let out by lancing externally. The splint had been kept quite clean, and as everything was going on well I left on the 9th.

June 11th. Saw the patient again. The left side appeared to be well united, but the right gave no indication of union, although the wound under it was nearly closed, the last of several pieces of bone having been removed some days before. I promised to remove the splint in four weeks from that date to examine the parts.

This splint held the jaw firm for sixty-eight days, when I removed it.

There was good union on the left side, but the right fracture was still ununited. For this, however, I was prepared, as the bone had been exposed so much during the twenty-four days which elapsed before I set it, and the saliva from the right parotid gland had discharged through the fracture from a short time after the attack. These unfavorable conditions, with other depressing circumstances, associated with an enfeebled condition from loss of blood, had been followed by necrosis of the ends of the bone on that side, and several pieces had come away externally during the first six weeks from the time the splint was applied, and also a long piece from the inside of the jaw on the left side.

I now removed the necrosed alveolar of the second bicuspid, but left the tooth in, as it appeared to have healthy connection with the lower part of its socket. The other teeth had grown firm. The splint had not been off the jaw a moment since its first application, and therefore little examination had been made internally, but external appearances had indicated that the saliva followed the course taken by the point of the knife. At this time, July 9th, Steno's duct proved to be completely closed. I could not pass the smallest probe even into its mouth, and the saliva discharged wholly through the ununited fracture.

Upon removing the first splint I immediately put another upon the teeth. This splint was ready for application, having been made on a cast taken from the original impression. This second splint was like Fig. 1. It covered all the teeth and gum, and was worn from July 9th to August 4th, when I removed it and put on a splint which allowed all the teeth to be seen, except the wisdom tooth on the right and the root on the left side, upon which it rested. This splint was worn screwed to the canines, until the beginning of September, four months from the application of the first splint. I saw the patient several times during the month of October. The jaw seemed to be getting firmer on the right side. On the left it was then quite strong, and all precisely in place.

The patient talked freely while wearing the splints, except for a few days at the commencement. From the time the second was applied, the jaw has been used for eating.

In letter to me of March 29th, 1866, the patient says: "The whole jaw moves quite well and firmly. Thus at last I begin to regard my cure in that respect complete."

I have not seen it myself since October, 1865, therefore cannot speak of it by personal observation.

Of the splints spoken of in this paper, with their wings and other appliances, I am enabled to give most decided assurances of their perfect adaptability to the purpose for which they were devised.

Having personally experienced their great advantage, and believing them to be superior to all other treatment, I have endeavored to make the application of them as easy as possible, desiring that others, whether practitioners or patients, may have the benefit of their use, when necessary.

Conclusion of Case 7.—September 18th. Pus again discharging profusely from the right fracture. Patient says, the bone moves; he points to the coronoid process. When the temporal and masseter muscles are brought into action, crepitus can be distinctly felt, especially if the finger is placed on the left angle where there is no swelling.

September 20th. Displacement of the right ramus outward, forward, and upward.

September 21st. Swelling and pain increased since yesterday. On removing the splint, I find good but flexible union on the left side; the right fracture proves to be very oblique and diagonal to the thickness of the bone; it commences outside the second molar, passes through the socket of the third (the extracted tooth), and terminates somewhere on the inside, short of the angle. Since September 5th, when the wisdom tooth was extracted, this fragment has had nothing to hold it back in place, except the roughness of the fractured surfaces, which may have given way under the action of the unusually strong muscles and the jarring of a severe cough. When describing the splints before the Academy of Medicine, I suggested that, when necessary, metallic points could be arranged in them to go into the bone. I now decided to apply one in this case, for as the line of fracture averages three inches around the bone, a salient edge, one inch and a half wide on each fragment, is pressing into the periosteum and other tissues. This can all be remedied by the aid of a piece of wire, which may go into the muscles, etc., perhaps a quarter of an inch, and press against the bone even less than that. A steel hook was, therefore, screwed into the end of the splint, just below the back corner of the upper wisdom tooth. The wire is a line in diameter and three-quarters of an inch long, clear of the splint. It is bent, so as to go down outside the bone where the ramus starts from the body. The point of the hook goes through the buccinator muscle and rests firmly on the bone. Firm pressure on the splint forced the ramus back, and the splint went on to the upper teeth, but at the expense of carrying the front of the lower jaw too much to the right, as the overlapping of the fragments did not yield readily. Packthread was passed around the right bicuspid and canine, and after drawing the front of the jaw to the left for ten or twelve minutes, the fragments came into position and the teeth went up in the splint. The bone was then quite firm, the action of the muscles causing no motion in it whatever.

Pain was felt for several days near the condyle and in the front of the ear, with occasional stinging in the temple; but this, with the swelling and suffering of the previous displacement, rapidly passed away.

October 4th. All the parts are looking better than at any time since the injury. The pus is much diminished, and the bone is held quite still.

October 8th. Only a little pus to be seen, but a piece of the alveolar which lies in the gum on the outside of the right second molar is nearly detached. No motion has been felt in the ramus since the hook was applied.

October 11th. Removed the loose piece of alveolar easily.

October 19th. Patient failed to call on the 15th and 18th, but came to-day, quite drunk. The splint is firm, however, and the bone doing well.

October 26th. His wife called and said he had been in jail since the evening of the 19th, and that for a week previous he had been drunk nearly all the time. She was afraid his jaw was injured, as he had thrown himself about very much and vomited frequently.

October 28th. I called at the prison. He looks thin and pale, but the jaw is doing well, and the splint secure.

November 24th. He has been out some time; I removed the splint to-day. The left side of the jaw is quite strong and there is good but flexible union on the right side. The hook has been worn sixty-four days without a moment's intermission; the hole left in the gum is just the size of the wire and the parts around are quite healthy. Splint dispensed with.

December 10th. The callus has stiffened very much since the splint was left off, and both sides of the jaw are now used in eating.

In this case neither weight nor distention could have displaced the bone, for the ramus was drawn upward and the swelling had subsided. The temporal and associate muscles must therefore have been the only cause of the displacement, although opposed by the body of the jaw, which was held still by the splint. This case, therefore, with the others used to illustrate the treatment, shows that the muscles are active causes of displacement, as distinctly intimated by me throughout the subject, and formally stated in the paper read before the New York Academy of Medicine, June 1st, 1864.

Other cases treated and seen by me also demonstrate that the opinion expressed so decidedly by Malgaigne and entertained by Hamilton, as to the effect of the impulse given by the cause of fracture upon displacement, is erroneous. For the impulse being exhausted in deciding the position, direction, and extent of the injury to the bone and surrounding tissues, the bone is then *surrendered* to the muscles which affected it before and at the time of fracture, and still continue to do so, according to *the condition in which it and they are left.*

In view of the importance of correct opinions upon this subject, my next paper will be upon the muscles which control and influence the lower jaw.

A meeting of the Society was held on Monday, April 1st, 1867, in the Philadelphia Dental College building.

The President, Jas. M. Harris, D.D.S., in the chair.

The Corresponding Secretary exhibited an automatic mallet that had been presented to the Philadelphia Dental College by Dr. Salmon, of Boston.

The use of the various forms of mallets, and of gold for filling teeth

was taken up for consideration. Prof. Kingsbury opened the subject by stating that he did not think himself as ready to adopt new instruments as some others; at first he had not approved of the automatic mallet, but since having tried Dr. Salmon's pattern he has used it nearly every day, and although in possession of another of a different make, he proposed to purchase one of these. He considered that only in some cases was the mallet of value, especially in large crown fillings; but in cavities with very fragile walls believed it dangerous. In his opinion the hand mallet, with an intelligent assistant, was preferable where convenient. Both automatic and hand mallets are now used by him, not, however, for any other reason than as labor-saving appliances, he deeming that economy of the vital force should always be studied.

Mr. Lamm's gold he had used much within the past six months, and has no fault to find with it; some crumbled, but he had that exchanged. There is but little waste, it is sufficiently cohesive to make a solid gold filling, is easily introduced, and condenses more readily than foil. He had not found the filling disintegrate, but thought it required care in manipulation around the edges of the cavities.

Prof. Flagg, as time was precious, offered his testimony to this extent, he having used some six or eight boxes of Mr. Lamm's gold, and has been from the highest point of admiration to the lowest point of disgust. It is from the easiest gold to work, up to the most difficult. This difference is due to the uneven characteristics of the material, excellent, indifferent, and bad, being sometimes found in a single sixteenth. Some six months ago this gold was first used by him, and with some few cases of exceptions he found it worked well. He made a filling under water, below the free edge of the gum, which is yet in good condition; this time was not, however, long enough to be any test. It had been suggested to use smooth, slightly serrated, and deeply serrated instruments; the slight serrations suited him best. He had always found the agents ever ready to exchange any of this make of gold that he condemned.

Dr. Truman asked if any one knew of the method of preparing Lamm's gold, and spoke of the crystal gold as having formerly had acid used in its manufacture, from which it sometimes was not thoroughly freed.

Prof. Flagg said, Dr. Arrington had assured him that there was nothing objectionable in this gold.

Dr. Head understood that there was a manufacturer experimenting with an article of gold which was expected to prove superior.

Prof. Flagg thought sponge or crystal gold is differently regarded now than formerly; he prefers it after arranging his foil at the cervical portion of the tooth.

Prof. McQuillen tried Lamm's gold when first introduced to the profession, his experience with it had been a varied one, having derived at times perfect satisfaction from its use, and then again nothing but disap-

pointment. Under these circumstances he had fallen back upon gold foil and Watts' sponge gold. The objections urged against sponge gold some years ago, were partly due to imperfections in the manufacture, which have been remedied, and still more to defective manipulation. He should be sorry to say anything which would be calculated to discourage another in his efforts to produce an article of gold such as the profession actually needs, and trusted that Mr. Lamm would continue his endeavors to develop such a desirable material.

Dr. Stellwagen had spoken at a previous meeting of the automatic mallet, and continued to find many nervous patients preferring its use to hand pressure, although there are many others who could not endure its blows, when sufficiently forcible to condense the filling properly. He had used several boxes of Mr. Lamm's gold, and this very day had attempted to rebuild the corner of a gold edge on a central incisor tooth, a portion of the gold having been broken off by a violent blow. This manufacture of gold was used on account of its being so highly recommended for its property of adhering to a filling already consolidated. After using all the necessary precautions to insure success in welding, and perhaps some that were unnecessary, five or six consecutive attempts proved failures, and he was finally compelled to drill a slight retaining point, and build up with crystal gold, to reproduce the symmetrical shape of the gold edge.

Dr. Ellis spoke at some length. He believed Mr. Lamm's gold to be capable of ready manipulation, and thought it had been urged as one of the recommendations, that it would build upon a different gold, and adhere firmly. His use of it had led him to consider it improving in quality, although that recently received was not quite so good. The best mallet is that in the hand of a proper assistant, from the fact of the force being an intelligent one. Crystal gold is a most excellent material, but as every one knew, would not work well under water.

Prof. Kingsbury remarked that he proposed an early visit to Europe, Egypt, and Syria, and expressed the hope that he might, while away, be able to gather some interesting points connected with the profession abroad, which, if worthy, he would bring before the Society.

The Society then adjourned to the annual meeting on the first Monday in May, after wishing the professor God speed and a safe return.

REPORT OF DISCUSSIONS OF THE SOCIETY OF DENTAL SURGEONS OF THE CITY OF NEW YORK.

BY J. S. LATIMER, D.D.S.

At the meeting, held November 7th, President Fitch in the chair, Messrs. Fitch and Mills said they had lately been using specimens of Thillon's foil, which they liked well.

E G. Kearsing, Bro. & Co., having sent in specimens of their foils, with the request that they be tested and reported upon, Messrs. J. S.

Latimer, G. A. Mills, and J. M. Crowell were appointed a committee for that purpose.

J. A. Brockway, of Albany, by request, presented specimens of dental substitutes mounted on aluminium base.

He softens the plate by annealing before swedging. If the plate be subjected to too high a heat in annealing, it will be blistered.

After swedging with metallic dies, he places the plate upon the plaster cast and burnishes it to conformity.

He unites the teeth to the base by means of block tin, which, not adhering to the aluminium, is retained by means of holes in the base, into which the molten tin runs.

The meeting of November 21st, at which Prof. McQuillen, by invitation, gave a very satisfactory explanation and defense of his description of the interglobular spaces in dentine, has already been reported in the DENTAL COSMOS, and need not be repeated.

At a meeting, held December 5th, the special committee appointed to test Kearsing's foil, presented the following report:

Mr. President and Gentlemen of the Society of Dental Surgeons of the City of New York,—The committee of three, appointed November 7th, to test specimens of Kearsing's foil, beg leave to report that they have faithfully tested the specimens presented by Messrs. Kearsing, Bro. & Co., and find them quite equal to any foil they have ever used. Nos. 2 and 3 they were especially pleased with: their toughness and pliancy make them excellent to use as soft foils, while annealing, though it renders the gold exceedingly adhesive, does not make it harsh and intractable. All of which is respectfully submitted.

J. S. LATIMER,
G. A. MILLS,
JNO. M. CROWELL, } *Committee.*

J. S. Latimer read a paper on "Contour and Flat Fillings."

B. W. Franklin read the regular essay on the subject for the evening, "The Best Base for Artificial Teeth."

It is difficult to say which is the best base to be used exclusively. A dealer in pictures can no more supply his customers with their portraits at wholesale, than we can procure appropriate teeth for our patients from the ready-made stocks in the shops.

J. G. Ambler indorsed many points in the paper. He believed that rubber, by cheapening artificial substitutes, had tempted people to lose thousands of valuable teeth which ought to have been saved. Had lately seen a case in which a man, calling himself a dentist, had sacrificed many very good teeth with a few defective ones, that he might insert others in their stead; rubber and gas are right in their places, but charlatans have made them curses.

J. S. Latimer thought the fault more in men than in the materials.

J. W. Clowes had seen the gums inflamed from wearing rubber plates.

J. S. Latimer thought this inflammation due rather to mechanical irritation than to chemical action. Any plate will irritate an unhealthy mouth.

T. H. Burras thought rubber required as much labor as any other base, if done well. He had used all methods and bases, and liked rubber. For many cases it is better than any other base. He had not seen anything to make him think rubber has a chemical effect upon the mouth. If the plate has a perfect adaptation it may act after the manner of the dry-cupping process, inviting blood to the part, and thus exciting inflammation. For beauty and expression continuous gum stands unequaled. He had known inflammation of the fauces to be consequent on wearing a plate which encroached too much on the velum palati.

S. C. Barnum had seen a case of inflamed fauces, which he believed due to the irritation caused by wearing a partial plate. He made another plate for the patient a year later, but this was equally unfortunate.

B. W. Franklin thought it unwise to judge of the merits of a base by what prejudiced persons may say of it. He believed, however, that the fact that ignorant men can and do insert great numbers of artificial teeth in the place of natural organs, which proper treatment might have saved, is a point well taken against rubber. He had seen one case in which a well-adapted plate produced sore mouth, and only one. He did not comprehend how the throat could be implicated in an inflammatory condition from such a cause. The bisulphuret of mercury is harmless, and cannot be decomposed except by high temperature. A lady patient informed him that she went to a "Cheap John" dentist for a set of teeth. Only a wax impression was taken, and no attention was paid to the occlusion and the shade of the teeth. The plate was "horrid," of course.

J. W. Clowes is a disbeliever in rubber for two reasons: first, it causes the loss of thousands of good teeth, because of the cheapness of substitutes on rubber; secondly, it makes the mouth sore. He believed gold unequaled for partial superior plates. In some cases in which the occlusion precludes the employment of porcelain teeth, he solders biting-plates on short teeth of gold to the base.

C. E. Latimer, D.D.S., deemed anæsthetics decided blessings. By the misuse of a blessing it may become a curse to us, yet the fault is with us and not in the agent. The same reasoning applies to rubber. He found many cases in which he believed he could better serve his patient by the employment of rubber than by the use of gold or platinum.

Though he defended anæsthetics and rubber against the wholesale condemnation they had received at the hands of other gentlemen, it did not follow that he sacrificed teeth that could be saved for the purpose of inserting others.

He believed that aluminium will yet be used and preferred for some classes of cases. One case had occurred in his practice in which a rubber

plate retained heat to an injurious extent. Such cases are remedied by inserting gold, on account of its greater conducting power.

W. H. Atkinson, M.D., believed gold best for all partial cases. No plate will give satisfaction until paid for. He would not say that he regretted rubber and gas so long as he believed in an overruling Providence. He hoped their abuse would bring us to our senses, and help us to cast anæsthetics to the nether regions, where they belong.

December 19.

W. H. Atkinson read a paper on "Temperaments," and another on "The Use of the File in Dentistry."

In reply to a question, he said the universe has and had, and always will have, the same amount of life, and there is no such thing as absolute death. On the subject of the evening, "Dental Education," he said, our dental societies are colleges; we must become not only good manipulators, but learned in the basal principles of our science. In teaching others we educate ourselves. It is not possible to become educated in dentistry away from our schools and societies. Persons proposing to become dentists should have first a thorough preliminary education.

John Allen, D.D.S., said that students should become acquainted with anatomy and physiology; then, when pathological conditions present, they could detect and correct them. But hygiene is really the most important department, and this should be impressed upon the mind of the pupil, for prevention is better than cure.

C. P. Fitch, M.D., claimed that little is really known of the forces manifested in life and function. What we *think* we know to-day, we doubt to-morrow. Some really intelligent men have professed to believe that empirical practice has been as often successful as that of learned indorsement. But we should learn and know all we can. With reference to fillings, he said gold may be so inserted as to protect the tissue covered but not adjacent surfaces; hence it does not necessarily insure the permanence of the tooth.

J. S. Latimer said the man who assumes the function of preceptor takes upon himself a great responsibility. First he should discriminate in the selection of pupils, and, having accepted the candidate, should not content himself with telling him merely to do the drudgery of the laboratory, and pick up any stray crumbs of knowledge he may find lying around loose, but he should put his pupil upon a regular course of study and clinical instruction. In this way he may discharge his duty.

Lecturers in our colleges should explain the meanings of the terms they employ, as far as possible.

When graduated, the pupil is only on the threshold of his studies, which must continue during all the years of his practice, if he would do his whole duty to himself, his patients, and his God; for, to reject study and the other means of increasing our efficiency, is to sin against all three.

THE ASSOCIATION OF THE COLLEGES OF DENTISTRY.

THE Association of the Colleges of Dentistry met in the lecture-room of the Philadelphia Dental College, in Philadelphia, on Wednesday, March 20th, 1867, at 10 o'clock A.M.

Professor E. Parmly, President, in the chair.

There were present from the Baltimore Dental College, Professors P. H. Austin, F. J. S. Gorgas; Ohio Dental College, Prof. J. Taft; Pennsylvania College of Dental Surgery, Profs. T. L. Buckingham, George T. Barker, E. Wildman, W. S. Forbes, J. Truman; Philadelphia Dental College, Profs. J. H. McQuillen, J. F. Flagg, Thomas Wardle, C. A. Kingsbury, J. E. Garretson, Lecturer on Clinical Surgery; New York Dental College, Profs. E. Parmly, F. D. Weisse, N. W. Kingsley, R. King Browne.

The minutes of the last meeting were read and approved.

The name of Prof. H. Judd, of the Missouri College of Dentistry, was presented for membership in this Association.

The following committee was appointed to receive and report upon the application.

Profs. George T. Barker, N. W. Kingsley, J. H. McQuillen, who, after due deliberation, made the following report:

We have examined the credentials of Prof. H. Judd as a delegate to this Association, and would respectfully report that owing to the peculiar position in which the institution now stands that he represents, we do not feel at liberty to recommend him as a member of this body, but would suggest that for the present he be invited to be present at the sessions of this meeting, and take part in the deliberations.

On motion of Prof. Weisse,

Resolved, That the resolutions presented, considered, and approved at the last meeting of this Association, be now taken up and adopted.

After which, resolutions, constituting regulations for all the Colleges represented in this body, were discussed, pending which the Association adjourned to meet in the lecture-room of the Pennsylvania College of Dental Surgery, at 3½ o'clock P.M.

AFTERNOON SESSION.

The following regulations and by-laws were adopted:

I. That the rule of our dental colleges, allowing one session in a medical college to be considered equivalent to one course in a dental college, be abolished.

II. That two full years of pupilage with a reputable dental practitioner, inclusive of two complete courses of lectures in a dental college, be required to entitle the candidate to an examination for graduation with the degree of D.D.S.

III. That a graduate of a respectable medical college, who has been under the pupilage of a reputable dentist for one year, and shall have attended one full course of lectures in a dental college, shall be entitled to examination for the degree of D.D.S.

IV. That eight years of dental practice, including regular pupilage, will be regarded as equivalent to one course of lectures.

V. That the regular term of instruction, in the dental colleges, be five months, the sessions in each to commence on the third Monday of October, annually.

VI. That students entering the colleges later than the 10th of November, will not be credited for a full course, nor be eligible to graduation at the same term.

VII. That a candidate for graduation will be required to furnish a written certificate of having fulfilled the required pupilage, or period of practice.

VIII. Regarding the education of the profession as the primary and only object in the establishment of dental colleges, therefore

Resolved, That while this Association does not forbid, it cannot approve the conferring of degrees upon persons who have not complied with the regulations agreed upon by this body, with the exception of gentlemen who have distinguished themselves as contributors to dental science.

The regulation marked number eight was *very* warmly and earnestly discussed by almost all the members; pending which, a motion was made by Prof. George T. Barker to lay it on the table. The vote upon this motion being taken by colleges was as follows:

Yea, Pennsylvania College of Dental Surgery.
Nay, Baltimore Dental College.
" Ohio " "
" Philadelphia " "
" New York College of Dentistry.

After some further discussion, and amendment of the resolution by Prof. Austin, the vote upon it was taken, and was as follows:

Yea, Baltimore Dental College.
" Ohio " "
" Philadelphia " "
" New York College of Dentistry.
Nay, Pennsylvania College of Dental Surgery.

Immediately after this vote, the faculty of the Pennsylvania College of Dental Surgery announced, through their dean, that the passage of this resolution rendered it necessary for them to withdraw from this Association, alleging for this movement their conviction that it is a rebuke upon their past practice of conferring degrees upon practitioners of dentistry, and also a restriction upon their intended future course in this respect.

SECOND DAY—MORNING SESSION.

Dr. James E. Garretson presented the following:

Resolved, That we recognize that the truest dignity of the dental, as any other specialty, is found alone in the education of its practitioners, and that this education should be one common to all medical men, and that it be the object of this Association of Colleges to so educate their students—advancing to this object as rapidly as circumstances seem to warrant, thus merging the specialty into the common mother practice.

This resolution called forth some earnest discussion, after which, the following was submitted by Prof. R. King Browne, and agreed to:

Honoring the sentiments which animate Dr. Garretson in the presentation of his resolution, and favoring the fullest and most ample instruction on the part of dental colleges, but considering it a matter which should be left to the different faculties, I respectfully move that the resolution be laid upon the table.

On motion of Prof. Weisse:

Resolved, That we reconsider the action of yesterday, in regard to the reception of Prof. H. Judd, of the Missouri Dental College, as a member of this Association.

The vote was unanimous for reconsideration.

On motion of Prof. Weisse:

Resolved, That on the establishment in the Missouri Dental College of such additional chairs as are regarded by this Association as necessary to qualify dental practitioners, viz., those of operative and mechanical dentistry, the said faculty shall become *ipso facto* members of this Association.

On motion of Prof. McQuillen:

Resolved, That the annual sessions of the Colleges begin on the 15th day of October, 1867.

On motion of Prof. Kingsley:

Resolved, That when this Association adjourn, it be to meet in the City of New York, on the 19th day of March, 1868.

It was moved that the expenses of the Association be paid by an assessment on the colleges.

On motion of Prof. Weisse:

Resolved, That the Secretary be requested to have the Constitution, By-Laws and Regulations of this Association stereotyped, for printing sheets for distribution to the different faculties.

Prof. J. Taft was appointed Treasurer of the Association.

A vote of thanks was tendered to the faculties of the dental colleges of Philadelphia, for the courtesy and kindness received at their hands by this Association during its sessions here.

The various faculties, in the person of their various official officers, signed the Constitution and By-Laws, after which the Association adjourned to meet in the City of New York, on the 19th day of March, 1868.

J. TAFT, *Secretary*.

TRANSACTIONS OF THE BROOKLYN DENTAL ASSOCIATION.

BY W. C. HORNE, NEW YORK.

February 20, and April 3.

THE TREATMENT OF CHILDREN'S TEETH.

DR. I. J. WETHERBEE, of Boston, said he delighted in the regulation and preservation of children's teeth. His practice is to fill the back teeth of the deciduous set with amalgam, and the front teeth with gold, or Hill's stopping. He considered it a duty incumbent upon every dental practitioner to save the first teeth as long as possible; their preservation and use being necessary to the development of the jaw. When the pulps of such teeth became exposed, he applied the usual arsenious preparation from three to six hours, then kept the cavity stopped with wax or other like substance from one to three weeks, at which time he inserts the filling.

Regulating children's teeth he considered both desirable and practicable. The doctor described various appliances to which he had resorted, with the results produced.

He recommended os-artificiel for filling over exposed pulps. In his own practice it had proved very successful; and it had been thoroughly tested by Dr. Keep, of Boston, with the best results. Its action was caustic, and caused a recession of the pulp; also absorbing whatever effusion might occur.

Dr. J. G. Ambler said he had been taking care of children's teeth for twenty-five years, and found the greatest difficulty to consist in getting control of the cases. Parents were frequently prejudiced against the use of any filling but gold, when a plastic material was the only one that could be used. Irregular dentition might be generally avoided by a removal of the first teeth, at or about the time of eruption of the second.

Dr. Clowes said that if any teeth were intended to be lost, they were the sixth-year molars. These were generally decayed by the time the bicuspids had made their appearance; and when thus decayed, and the other teeth crowded, he removed them to give room to the others. This was a very important matter, for wherever the food is retained, decay will occur; not one patient in fifty is careful enough to prevent it. A crowded condition of the teeth prevents the proper use of the tooth-pick. He would have it distinctly understood that he did not favor the extraction of these teeth, if they were good, but only on the conditions above named. The proper time for their removal would be at the eruption of the second bicuspid; in that way a good development of the other teeth would be secured. If these teeth remained in the mouth until the twentieth or twenty-fifth year undecayed, they should not be removed.

Dr. E. A. Bogue instructs his patients minutely as to the care of their teeth, believing that no fillings are good enough to remain in with the

mouth kept unclean. He instructs them that dentists are adjuncts to civilization; that as we advance in civilization, become effeminate, and use soft food, the teeth, from lack of use and by what is left about them, are decayed. The gums need exercise as well as the teeth need brushing, and the brush must be vigorously applied, and a new one brought into use every month. Such care, with the watchfulness of a competent dentist, continued till the twenty-fifth year, will pretty certainly preserve the teeth.

Dr. John Allen impressed the necessity of a good development of the jaws and teeth as preventive of decay. He would secure this by supplying the system with a due proportion of bone-making material in food. The doctor said he had collected the facts on which his theory was based from observations made in all quarters of the globe.

Dr. C. P. Fitch suggested that it was not always best to form a theory and then set to work to find facts to suit it. He recommended preservation of the first teeth by filling till the appearance of their successors. The sixth-year molars were the most important teeth in the mouth for mastication and for support of the others, and they should not be removed when their preservation was possible.

Dr. Atkinson said "the whole need not a physician, but they that are sick," is as true with reference to organs as to the entirety of the person. *Liability* to disease, at least is tacitly conceded in the bare asking for the treatment requisite to secure the health of the organs subjected to its exercise. Past experience has sadly proven the deteriorating effect of civilization upon the human body. And yet a complete civilization would antidote all the evils consequent upon this partial understanding of the laws of life, and the false regime resultant upon this want of knowledge, and bring us forth complete in all our parts. Full flow of functional freedom can alone evolve or nourish an organ or a system in preciseness of proportion or persistency of purpose. Hence the necessity for sedulous care, in securing the requisite conditions to health, at this beginning of the battle of life, in which the organs are stamped with strength or weakness, according to the fulfillment or infraction of the laws of organology.

The treatment, or rather the management of children's teeth, properly divides itself into hygienic or prophylactic, and remedial or redemptive management. The first teaches, or rather requires us to avoid disease, by preventing derangements before they make their advent felt by arrest of the function or growth of a part. The first and highest object of treatment is to secure the full normal development of the teeth of the child, which will mark the health and strength of the entire body. This can only be done by abundant air, food, and exercise being supplied to the entire motive and nutrient system.

After disease or arrest of development has already taken the control of any portion of the economy, we are called upon to apply redemptive or

remedial means and measures. The means and measures adopted by the practitioner will always mark his standing and ability, or want thereof to diagnose the conditions of departure from healthy expression, and give a prognosis that will or will not be realized in the issue of the case. If extraction of the teeth be resorted to before the advancing teeth of replacement make it requisite, the standing of the operator is low; and his ability but want of knowledge and skill adapted to the case. The proper treatment of the teeth of children when much diseased, is indeed a work demanding skill, probity, patience, and persistence of no ordinary degree. There is scarcely a single condition under which the vascular loop or pulp of a deciduous tooth can be safely devitalized, as a remedial measure! Such is the succulent condition of the surrounding and adjacent parts at this early period of development and growth, that the gentlest treatment possible is demanded of us, combined with constant and scrupulous watching by even semi-daily examinations in many cases. Overdosing and heroic handling come not within the range of judicious expression of knowledge and skill. The subduing method can only be exercised by a tyrant and submitted to by a slave! He was convinced that more harm results to the individual who is dominated by an unkind superior force, to effect the work of remedying lapses in mind or body, than can come by even tardy performances that are made with his consent and coincidence.

When children, as a rule, shall look upon their visits to the dental office as holiday sports, we shall have inaugurated a practice that obtains at present with such a very few as to make it *outre*, transcendental, and utopian, in the eyes of all who have not the patience first to learn with what they have to do, and then to take the time and labor necessary to its nicest accomplishment, be it fashionable or unfashionable, and so those who are bent upon making money, clean or unclean, in the treatment of children's teeth.

Clean teeth are sound teeth the world over. Then let us treat children's teeth by any and all means, which the circumstances of each case demand, so as to render them capable of being kept clean; and we shall have faithfully acquitted ourselves in this regard.

Dr. J. S. Latimer said the remarks of Dr. Atkinson presented a very important question: Is it safe to devitalize the pulps of deciduous teeth with arsenical preparations? His practice was mostly with adults, but he occasionally had unpleasant visitations from little patients with streaming eyes. He endeavored to allay the fears and get the confidence of children, but never deceived them; rarely removed a child's tooth because it ached, and quite as rarely devitalized the pulp; generally resorted to palliatives, as creosote on cotton.

Dr. Mills had been successful in the use of Hill's stopping for children's teeth; does not like amalgam. He does not operate for children

until he gets their confidence—rarely at the first sitting. He had recently prevented the formation of a fistula upon the cheek, by frequent rubbing of the face and gum.

Dr. Coffin, of London, by invitation, made a very interesting statement regarding the dental profession in England. He mentioned the use of a brush of soft rubber for the gums, which was found useful in preventing alveolar abscess from pointing externally.

Dr. J. S. Latimer said the specific gravity of a gold plug which he inserted, and which was lost from breaking down of the walls some months later, was found to be 15·3, while that of an ingot of gold is 19·3; a difference of 21·6 per cent. This plug had been condensed with a mallet.

Dr. E. A. Bogue suggested the use of rubber tubing on bur handles, to prevent their chafing the lips.

Dr. C. E. Francis read the following paper on

IODINE.

In the year 1812, a manufacturer of soda or saltpetre in Paris, by the name of Courtois, discovered this substance, and brought it to the notice of the scientific world. It was examined by the leading chemists of the day, prominent among whom was the celebrated *Joseph Louis Gay-Lussac*, who made many experiments with iodine and bromine (which was discovered a few years subsequently), and published accounts of his researches in the leading medical journals of Paris. In these articles he gave an elaborate description of the peculiar properties of iodine and its process of manufacture. It is a non-metallic element, of a crystalline nature, in flat, glassy scales, or elongated octahedrons. The crystals are brittle, opaque, bluish or grayish-black; and present a brilliant metallic lustre. When exposed to the air it is volatile, diffusing a pungent odor somewhat like chlorine. When exposed to heat it produces a vapor of a deep violet hue, and from this it takes its name. Its specific gravity is 4·95, fuses at 225° F., and boils at 346°, emitting a dense vapor which is more than eight times heavier than atmospheric air. It exists in various marine plants, in sponges, coral, etc. The bittern of salt works, the brine of the ocean, and some of the mineral springs, possess it in a slight degree.

The commercial preparations are manufactured in Glasgow, Donegal, and Cherbourg, in France. The sea-weeds, washed by the ocean tide upon the coasts of Scotland and Ireland, contain a large proportion of iodine. These are collected, dried in the sun, and burned, and the ashes, called "kelp," are carried to the various laboratories for analyzation. Combined with the iodine are various soluble salts; these, by a somewhat tedious chemical process, are separated, and the vapor of iodine is collected in glass receivers, connected with condensers, causing a deposit of brilliant crystals. As iodine is very volatile, and much of the vapor

is lost by the heat required to reduce the sea-weed to ashes, a new method has been adopted and patented in England, whereby this and the other volatile vapors may be saved and utilized. The sea-weeds, which may be gathered in all seasons, are dried and compressed into cakes; these are inclosed in sealed cylinders and thoroughly charred, and the residue treated as "kelp."

Iodine is to some extent useful in the arts. Combined with potassium and silver, it is used in photography. It is a test for starch, giving color to a hundred thousand times its own bulk of a cold aqueous solution; it is also an ingredient of various chemical reagents. For medicinal uses, iodine has become a drug of considerable importance, and when its properties are more thoroughly understood it will undoubtedly be more extensively used; for even at this advanced stage of scientific investigation it is doubtful if its real value as a remedial agent is properly appreciated.

The solvents of iodine are alcohol, ether, and glycerin. Pure water takes up but the least atom of it, just sufficient to become slightly discolored; if, however, hydrochlorate or nitrate of ammonia, chloride of sodium, or any of the *iodides* be added to the water, its power of dissolving the iodine is much increased. It also combines readily with all the metallic and most of the non-metallic elements, forming the class of compounds known as *iodides*.

Iodine was first employed as a medicine by Dr. Coindet, a physician of Geneva, in the year 1819, and every successive year has brought it into more extensive use. It is generally used in combination with other substances. These combinations are somewhat numerous, the most important of which is the iodide of potassium, a white semi-transparent crystal, slightly deliquescent, and possessing a sharp, saline taste. This salt is used for scrofulous diseases, rheumatic troubles, syphilitic or mercurial poisoning, etc. Combined with an equal weight of iodine, it causes the latter to dissolve readily in a small quantity of water, forming an excellent caustic solution for topical application, as for destroying fungous granulations, lupus, etc. In various grades of dilution it is advantageously employed to dissipate glandular enlargements, tumors, and boils, and as a remedy for periostitis, periodontitis, epulis, distortions of the spine, disease of the hip-joint, white swelling, scrofulous or syphilitic ulcers, aphonia, goitre, inflamed conditions of the uvula and fauces, chilblains, bites of venomous reptiles, etc. For disease of the heart, liver, kidneys, spleen, pleura, uterus, and testes, iodine has been successively employed, both as an external and internal remedy. Combined with glycerin, it may be advantageously applied in cutaneous diseases. Combined with opium, tannin, etc., it has been of much benefit as an injection in cases of fistula *in ano*, hemorrhoids, leucorrhœa, ozæna, etc. In combination with creosote, it has proved invaluable in the hands of the dental surgeon as a cure for alveolar abscess. This preparation was, I think, first introduced or sug-

gested, by Dr. Varney, and has been a means of saving and restoring to comfort and usefulness many diseased and offensive teeth, which might otherwise have been sacrificed as worthless.

The vapors of tincture of iodine, combined with tincture of conium or camphor, have been recommended in cases of catarrh, phthisis pulmonalis, and chronic bronchitis; and employed, as is stated, with some degree of success. The compound tincture of iodine, considerably diluted, has also proved beneficial as a gargle for mercurial salivation and ulcerated conditions of the gums. Iodine baths are frequently resorted to for the cure of some of the diseases already referred to.

Taken into the stomach in frequent small doses, iodine acts as a tonic. It is largely absorbed, however administered or applied, and rapidly enters the circulation, which is much excited by its presence. Numerous observations have proved that whether taken internally, or applied externally, it always passes in some combination, as an *iodide,* into the secretions, particularly the urine and saliva. It has also been detected in the blood, milk, and perspiration. It never accumulates in the system, but its rapid elimination by the urine through the kidneys, is supposed to carry off with it more or less abnormal material, thus acting as a sorbefacient. Iodine used in various degrees of concentration, or in its varied combinations, may be a corrosive, irritant, desiccant, tonic, diuretic, diaphoretic, or emmenagogue.

Reviewing its many benefits, this peculiar substance is entitled to rank among the prominent sanative agents of the day, and one of great blessings to mankind. Where, in the broad field of medical research, can another agent be found that will enter into a larger number of combinations, or prove useful in a greater variety of diseases?

The Association then adjourned.

MAINE DENTAL SOCIETY.

BY THOMAS FILLEBROWN, LEWISTON, ME.

This Society was formed at the Maine Medical College building in Brunswick, on the 18th of September, 1866; Dr. E. Bacon, of Portland, was elected President, Dr. Wm. Randall, of Farmington, Vice-President, Dr. Thomas Fillebrown, of Lewiston, Secretary, and Dr. A. K. Gilmore, of Bath, Corresponding Secretary. The Society holds its meetings quarterly. The first was held at Augusta, and the last was held at Portland, a report of which is appended.

The dentists of Maine are well aware of their backwardness in the formation of a society, and now that they are on the right track, they feel they would like the profession in other States to be aware of it. The Society was duly incorporated at the last session of our Legislature.

The Society was called to order by the Secretary, and in the absence

of the President and the Vice-President, Dr. T. Haley, of Biddeford, was called to the chair.

The President, Dr. Bacon, of Portland, was prevented from being present by death in his family.

Dr. J. T. Chase, of Hallowell, and Drs. Henry Kimball, W. R. Johnson, S. C. Fernald, Charles Kimball, F. A. Prince, all of Portland, were elected active members of the Society, and Dr. C. R. Coffin, of London, England, corresponding member, and Dr. L. D. Shepard, of Salem, Mass., and I. J. Wetherbee, of Boston, honorary members.

The Committee on form of certificate and seal for the use of the Society, of which Dr. Bacon is chairman, was given further time to report.

It was voted to send delegates to the next meeting of the American Dental Association, and Drs. E. Bacon, Wm. Randall, A. K. Gilmore, and Thomas Haley were chosen as such.

The responsibility of the profession in regard to dental students and the proper means of elevating the standard of the profession, was interestingly and ably discussed by Drs. Gilmore, Coffin, Johnson, Fillebrown and Pinkham. It was affirmed to be the duty of every member of the profession to form a candid judgment as to the natural qualifications of any person desiring to become his pupil, and if in his opinion not adapted to the practice of dentistry, to decline to take him as such, and also to advise him to seek some other calling. That it is the duty of every one entering the profession to graduate from some one of our excellent dental colleges, and also of the younger members of the profession now practicing, to avail themselves, if possible, of the same privileges; that not many years hence the people will as surely demand of every dentist his credentials as they do now from every physician.

EVENING SESSION.

The following was passed unanimously:

Resolved, That the thanks of the Society be extended to the City Government of Portland for the free use of the Council Rooms for the meetings of the Society.

The question, How to preserve the natural teeth? was then taken up and ably discussed by Drs. C. N. Pierce, C. R. Coffin, I. A. Salmon, L. D. Shepard, W. R. Johnson and Chas. Kimball.

Dr. Coffin spoke at length of the great necessity of properly preparing the mouth of patients before attempting the operation of plugging the teeth. The gums were frequently much inflamed and teeth loosened. The inflammation should be reduced and a healthy state of the mouth induced. Tartar is the great cause of this trouble and may be present even if not visible. It is frequently deposited in thin hard scales upon the roots, even to their apices. It must all be thoroughly removed before a cure can be effected. It requires a sharp square edged scaler,

similar in form to ordinary excavators that can be passed up under the gums, to remove it. After scaling the teeth and roots, treat the gums with iodine one part, creosote two parts, repeating the operations every two to four days until cured, which may require some weeks.

WEDNESDAY MORNING SESSION.

The following named physicians were elected honorary members of the Society: C. H. Burr, H. N. Small, and A. S. Thayer, of Portland.

The Committee on Incorporation reported that a bill had passed the Legislature as desired, and the Maine Dental Society is now a legally organized body.

The choice of place to hold the next meeting was left with the Executive Committee, but the prevailing sentiment seemed to be in favor of Bangor.

This was the second meeting of the Society since its formation, and was very fully attended, and a great deal of interest manifested, with a determination that it shall be a success. Several members volunteered to produce some written essays upon subjects connected with their practice, to be read at the next meeting, thereby making the exercises more interesting, and accomplishing more in the limited time of the sessions.

MARYLAND ASSOCIATION OF DENTISTS.

February 28.

ADDRESS by Dr. Robt. Arthur. Subject—"Dental Caries, its Nature and Treatment."

The erroneous opinions which have been entertained respecting the decay of the teeth and its treatment were briefly reviewed. The true theory and the best method of treating the affection was ably discussed.

Decay is purely the effect produced by acids acting upon the enamel and dentine.

The position was assumed that when decay commences on the sides of teeth in contact, no kind of care on the part of the individual whose teeth are so affected can stop the progress of the disease. Professional treatment was imperatively demanded. In what the treatment should consist was plainly indicated by the nature of the disorder itself, and the simple dictates of common sense. His method of procedure was to separate the teeth completely and permanently.

The affected teeth *must be so cut away as to prevent them from coming in contact again.* Every particle of decay must be removed, and the surfaces treated, left smooth, and highly polished. The separation should be made by so removing the affected parts from the direction of the lingual angles of the teeth, as not to disfigure or mar the good appearance of the teeth. The mere filing of teeth apart, and then allowing

them to come in contact again, was worse than no treatment at all. The practice was condemned, of pressing teeth apart for the purpose of filling them, and then allowing the lateral surfaces to meet again.

In the treatment of children's teeth, whenever he found decay upon the incisors (laterally) of a child before it was twelve years old, he proceeded at once to separate all the teeth, excepting in most cases the lower incisors. He deemed it very important to preserve the sixth-year molars. They are the most important teeth of the denture. In cases where lateral decay seemed to be indicated he cut away the *deciduous* teeth, so as to separate entirely the same from the sixth-year molars.

He did not presume to aver that the treatment would prove infallible in all cases. If it should prove successful in eight cases out of ten, he thought it sufficient to recommend its adoption. He thought it would be found far more generally successful than many might suppose. He found it to be surprisingly successful in his own experience, which was far from being limited.

Dr. Fouke followed in remarks corroborative of the treatment. The file was an invaluable instrument in the treatment of incipient decay. A firm advocate of filing teeth, the able and, in some respects, *novel* discourse of the distinguished speaker has made him still *firmer* in his long-settled convictions of its utility.

Dr. McDowell heartily acquiesced in the views of the speaker. He spoke of his experience with the file and other cutting instruments, and regarded them as invaluably useful in giving such form and contour to the teeth as would conduce to their better preservation, and also to promoting the health of the mouth, especially in parts contiguous to the dental organs.

SELECTIONS.

Medical and Surgical Reporter.

Surgical Department Philadelphia Dental College. Clinic of Jas. E. Garretson, M.D., D.D.S.—Reported by H. L. Gilmore, D.D.S.

Removal of Tumors—Local Anæsthesia.—At a previous clinic, gentlemen, I suggested that I would avail myself of the earliest opportunity to exhibit, in connection with surgical operations, the spray-producer of Dr. Richardson, of England, expressing myself, as you will recall, as being much impressed with the anæsthetic qualities of the application, as applied to cases for which it seems adapted.

Before you, I have the pleasure to bring this afternoon three of my private patients, who are kind enough to allow, for your instruction, certain operations which they require, to be performed in your presence.

This lady has, as you see, a tumor situated in the parietal region of the scalp. It is very movable, and to the touch, very spongy and elastic. It is, what I have no doubt you all recognize as a wen, or sebaceous

tumor. A sebaceous tumor is about the most simple and harmless form of pathological condition. The duct of a sebaceous gland becomes, by some accident or other, obliterated or closed up. The gland, maintaining its integrity, continues, of course, its work of secretion; but there being no duct of egress, this secretion accumulates, from necessity, back of the structure, and to accommodate itself, enlarges or expands the containing duct. The absorption of the more fluid portion of the secretion gives, of course, a solid or semi-solid mass; hence the tumor becomes elastic to the touch. As such tumors increase in size, they of necessity intrude upon the gland proper; and thus finally the secreting agent is spread out as a cyst or sac around the tumor; hence the recognized fact, that to cure these tumors you must dissect out the sac.

Here is a second tumor; it is of the same character as the first, but situated on the forehead. These tumors are almost as frequently multiple as single. I have seen a scalp literally covered with them; and you will find them from the size of a pea to that of the largest apple.

Here is another patient, with a similar class of growth, directly over the sagittal suture. To get at these tumors, it is not necessary to destroy any considerable portion of the patient's hair. It is enough, as I have proven with sufficient frequency, simply to part the hair over the middle of the growth, and with the scissors, clip away that alone which would interfere with the incisions. If the tumor has so expanded the scalp as to make necessary the removal of an ellipse, then, of course, it will be necessary to remove all the hair that may cover this ellipse; but if, on the contrary, the tumor may not exceed in size an ordinary walnut, the incision may be a simple one, and only a line of hair need be removed.

I will now remove just as much hair as I deem necessary. I now take from either side of my proposed line of incision, three strands of hair, and wax them, and carefully lay them down on the sides of the head; these strands are to be the ligatures by which, after the removal of the cyst, I close the wound. I am now ready to apply the spray. The application of the spray of ether first suggested itself to Dr. Richardson, of London, and the apparatus I hold in my hand was devised by him for the purpose of producing such spray. The principle on which this spray acts, is the principle which makes the lobes of your ears without feeling, when subjected to great and continued cold. It is really a process of freezing, but unlike the freezing by atmospheric cold, it is not liable to be followed by injurious reaction; at least I have myself used the agent in quite a number of cases, and without any very special care, and I have yet seen no trouble from such reaction. Dr. Richardson uses ether for his spray. Rhigolene, a fluid of less specific gravity, is highly commended by some; my experience with it does not permit my joining in such commendation; it has not, in my hands, produced the insensibility of ether. Here is a bottle of rhigolene; if I clasp my hands about the flask, the fluid will boil. It boils at 70° Fahrenheit.

The operator should not, himself, spray a part; it makes his hand shaky. You throw the spray until the skin begins to blanch; it is then ready for the knife; and the spray should continue to be thrown so long as the operation continues.

(To be continued.)

PERISCOPE OF MEDICAL AND GENERAL SCIENCE IN THEIR RELATIONS TO DENTISTRY.

BY GEO. J. ZIEGLER, M.D.

"*Dental Tissue.—The Histological Doctrines of M. Robin.* By WM. T. LUSK, M.D., New York.—A tooth is composed of five parts: 1st, the pulp or bulb; 2d, the ivory; 3d, the enamel; 4th, the cement; 5th, the cuticle.

"The *pulp* is formed of a special substance, termed *phanerogenic tissue* (*tissu phanérogène ou phanérophore*), which consists of—1st, special, small, ovoid nuclei; 2d, elements of connective tissue at all stages of development, *i.e.* of embryo-plastic nuclei, fibro-plastic bodies, and connective-tissue fibres; 3d, special amorphous matter; 4th, in the phanerogenic tissue of teeth we find, in addition to these elements, concretions of phosphate of lime. This substance becomes vascular only when the mass formed by it has attained a certain volume. The *ivory* or *dentine* is characterized, like the osseous substance, by the presence of canaliculi, which are of an extremely fine character. The *enamel* is formed by the juxtaposition of special elements, termed *prisms* of *enamel.* These prisms are placed side by side, much in the same way as the prismatic epithelial cells. The *cement* is composed of osseous substance. In the young the layer is too thin to contain Haversian canals; but as it becomes thickened, in advanced age, the canals form as in bone of corresponding dimensions. In young persons the enamel is covered by an exceedingly delicate membrane, termed the *cuticle* of the enamel. It is transparent, hyaline, and, notwithstanding its delicacy, very resistant to the action of the mineral acids. In the adult the cuticle appears to wear away. The enamel and dentine, though non-vascular, appear to be endowed with a good deal of vitality and reproductive power. Examples of dental callus have been observed.

"*Development of Teeth.*—Toward the 60th or 70th day the maxillary bones present upon transverse section a grooved appearance—the concavity in the inferior maxilla looking upward, that of the superior looking downward. These grooves are filled with a form of embryonic connective tissue, characterized especially by a considerable accumulation of embryo-plastic nuclei. This tissue is vascular, and has been designated *subgingival mucous tissue.* In it, at a given moment, small, oval nuclei, characteristic of phanerogenic tissue, make their appearance, and soon form into little collections devoid of vessels, which are easily distinguished from the surrounding connective tissue. These collections are the first germs of the teeth. At the superior portion of the germ the amorphous matter of the phanerogenic tissue does not contain nuclei, but forms a clear zone, about ·010 in thickness, termed the *preformative membrane.* At a later period the germ is surrounded by a very dense and vascular layer, the *follicular wall*, formed of the same elements as the surrounding tissue, but much more closely pressed against one another. The bulb (represented by the follicular part of the tooth, *i.e.* the germ and the follicular wall) next appears, divided into two entirely distinct parts, separated by an undulatory line of demarkation—the lower part consist-

ing of phanerogenic tissue and the preformative membrane, while the upper is occupied by a special organ of a transitory character, termed the *organ* of the *enamel.* The latter is composed of connective tissue analogous to that of the jelly of Wharton, *i.e.* formed of a small number of stellate, fibro-plastic bodies in an abundance of amorphous matter. It is limited upon the side of the follicular wall by a single row of nuclear epithelium, while upon the side of the undulatory line it is limited by a row of prismatic cells, which are all of nearly one size. At a further period of development the phanerogenic tissue becomes vascular, and, at the same time, upon the limit between the nuclei and the preformative membrane, there appears a single row of cells, termed *cells* of the *dentine.* These are irregular, elongated, and in close juxtaposition. They possess a hyaline, transparent extremity turned toward the organ of the enamel, but separated from it by the preformative membrane. The part of the cell in contact with the phanerogenic tissue is granular, and contains a nucleus. The hyaline extremities next unite partially with one another, leaving, however, in the angles they form, little canals which become the characteristic canaliculi of the dentine. The canals present at first, upon section, an angular appearance, and only subsequently become rounded. Finally, the entire cells become completely transformed into dentine, and form a small, very delicate, conical or undulatory shell, called the dentinal crown (*chapeau de dentine*). The number of eminences in the crown corresponds to the number the tooth is destined to have at a later period. When the crown has extended over the whole of the phanerogenic tissue, the prisms of enamel make their appearance between the crown and the preformative membrane, which has now become very thin. Each prism appears opposite the prismatic cells already described as limiting the organ of the enamel; but the prisms, instead of being of equal size, like the prismatic cells, are much longer upon the summit of the crown, and diminish in size as they approach the edges. Subsequently the organ of the enamel atrophies. Its fibro-plastic bodies pass into the state of adipose vesicles. Then all the elements of the organ liquefy, and finally disappear. In like manner the superior part of the follicular wall becomes atrophied to allow the passage of the tooth, which is at this period composed of the cuticle (until now termed the membrana preformativa), the enamel and the dentine. After the disappearance of the dentinal cells the dentine grows independently. The tooth, however, now no longer increases in a transverse direction, but in length only, by encroaching upon the phanerogenic substance, which soon forms simply the bulb of the tooth. At a still later period the cement is developed between the dentine and that portion of the follicular wall which has persisted around the root. This persistent portion thus becomes the alveolo-dental periosteum. Upon the formation of the crown of the tooth, little free masses of phosphate of lime appear in the phanerogenic tissue, and remain through the whole period of existence.

"*Caries* of the teeth is ordinarily due to the softening of the dentine, which becomes fatty, and loses its mineral before its organic elements. The cement is frequently the source of osseous tumors, described under the name of *exodontoses.* The cement and the alveolo-dental periosteum are frequently the point of departure of the tumors of myeloplaxes, known as *epulis.* The most remarkable pathological production, dependent upon the dental system, are *tumors* formed of *phanerogenic tissue.* They are frequently of considerable size, and present the appearance of a cluster

of little bulbs closely pressed together and covered by a crown of dentine, giving to the surface of the tumor a crepitant sensation. In the tissue of these tumors we find the habitual density and transparency of the phanerogenic tissue and its characteristic nuclei. In another class of these cases, however, the phanerogenic tissue may present a totally different physical appearance upon section, resembling much, in color and consistency, the tissue of a potato. These properties are due to the presence of considerable microscopic masses of phosphate of lime, analogous to those found normally in the pulp of the teeth after the appearance of the crown of dentine. All the 'products' of the economy are, in a high degree, susceptible of *heterotopy.* Teeth frequently appear in this way in the ovary. It is difficult to refer these formations to the fœtus, as there is at least one observation recorded where more than 200 teeth were found. Heterotopic teeth possess all the dental constituents, viz., pulp, dentine, enamel, cuticle and cement. They are not always implanted by the root in the surrounding tissues, but may simply adhere to the walls of a cyst."—(*New York Med. Jour.*)

Denticles, etc. of Common Snail—Helix Albolabris.—"Just beneath the lower tentacles the mouth is situated, having on the upper lip a crescent-shaped jaw (fig. 7, plate 1), of a heavy texture, and quite hard. In some species of snails, the jaw is quite smooth, and has a slight projection on the cutting edge. In other species, the larger ones especially, the jaw is ribbed, and the cutting edge is notched and jagged like so many teeth as it were. In fact this jaw answers all the purposes of an upper set of teeth, for it is capable of biting through the thick leaves of a cabbage ; as can be easily proved, by keeping a snail in confinement, and feeding it on cabbage or lettuce, of which it is very fond. When feeding, all the movements of the mouth are plainly visible, and not only can the little semicircular cuts of the jaw on the leaf be seen, but while feeding the nipping sound of the bite can be distinctly heard. The larger snails are also very fond of flour paste, and while luxuriating in this simple diet each white mouthful can be easily traced in its course, from the mouth to the stomach, owing to the translucency of the snail's body. The lower lip is not furnished with a plate, but just within the mouth there is spread a membrane, very appropriately called the *tongue* or lingual membrane, as the snail uses it in lapping its food. This membrane is quite long and broad, and is covered with minute silicious denticles, or teeth, as they are called.

"As an object for the microscope, it will repay one the trouble attendant on dissecting this membrane from the mouth of a snail. A magnified figure of the entire tongue is given on plate 1, fig. 6. Nothing can exceed the beauty and regularity in the form and arrangement of the denticles. These are pointed and turn backward, thus forming a series of little claws and hoods, and are admirably adapted to perform the rasping function allotted to them; fig. 5, plate 1, gives a side view of a few of these teeth to show their hooked character. The number of denticles on the tongue is very great. Some species, the white-lipped Helix, for instance, having nearly twelve thousand denticles. It is difficult to conceive the minuteness of these particles, when we consider that the membrane on which they rest is not a quarter of an inch long, and only half as wide. The denticles are arranged in regular longitudinal and transverse rows. Figure 3, plate 1, represents two transverse rows of these

denticles, and fig. 4 a central tooth, with lateral teeth more highly magnified to show their form. It will be noticed that the central denticles are symmetrical in form, having the two sides alike, while those on each side are not symmetrical. In illustrating the dentition of a species, it is only necessary to draw one-half of one transverse row, including the central denticle, at the same time mentioning the number of transverse rows on the membrane; thus in the white-lipped Helix, a specimen of which we examined, we found eighty-nine denticles in a transverse row, that is, one central denticle, flanked on each side by forty-four lateral denticles. There were one hundred and twenty-three transverse rows, making the whole number of denticles on the membrane ten thousand nine hundred and forty-seven, or, about eleven thousand. The form and number of denticles in each species vary, as we shall show hereafter."—(*Amer. Naturalist.*)

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Recuperative Power of Snail.—"The power possessed by the snail to reproduce certain portions of its body removed by violence, has long attracted the attention of Zoologists. The horns, or tentacles, and even portions of the head have been cut away, and in due course of time these lost parts have been restored by a new growth. The whole head has been cut away, and though in many cases terminating the life of the victim, yet in some instances the parts removed have been fully restored. This seems the more wonderful when we consider the complicated character of the head and mouth. The shell may be broken, and even portions of it removed, and yet after a certain lapse of time the injured parts will be repaired by a deposition of shelly matter at the fractured parts."—(*Ibid.*)

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"*Of Nerve-centres.* By DR. LIONEL S. BEALE, F.R.S., Fellow of the Royal College of Physicians, Physician to King's College Hospital, and Professor of Physiology and of General and Morbid Anatomy in King's College, London.—The essential structural elements of every nerve-centre are *nerve-cells* and *nerve-fibres.* The nerve-centres or ganglia of man and the higher animals are highly vascular, and, there is reason to believe, receive a large supply of arterial blood; but there are nerve-centres consisting of only three or four cells, which have no special capillaries.

"In and around nerve-centres which are fully formed is a little connective tissue, and the proportion of this increases as the ganglion advances in age. It is not an *essential* structure, nor is it required for the support of the nerve-cells and nerve-fibres, as some have supposed; for in the ganglia of some of the lower animals connective tissue is not to be found, and in no ganglion is it present at an early period, when the cells and fibres are softest, and therefore in greatest need of a '*supporting framework.*' The 'connective tissue' is probably but the remains of nerve-cells, nerve-fibres, and vessels which were in a state of functional activity at an earlier period of life.

"Concerning the relation of the *cells* of a nerve-centre to the *fibres*, there is the greatest difference of opinion among observers, and some anatomists still maintain that there are nerve-cells destitute of fibres altogether, while many conclude that, of the numerous fibres proceeding *from* some nerve-cells, several are not nerve-fibres at all. It has been supposed by some that a cell may influence a fibre which passes near it; but others have held that, for a fibre to be influenced, it must be structurally

connected with the cell. It is not, however, my intention in this paper to attack the views of others. I desire only to state as briefly and as clearly as I can the conclusions forced upon me by many years' careful investigation of the minute structure of nerve-centres in man and the lower animals. The facts upon which these conclusions are based are detailed at length in memoirs published in the *Philosophical Transactions*, the *Proceedings of the Royal Society*, the *Transactions of the Microscopical Society*, the *Archives of Medicine*, and the *Medical Times and Gazette*.

"The conclusions at which I arrived may be briefly expressed as follows:

"1. Every nerve-cell is constructed with at least two nerve-fibres.

"2. Where many fibres or processes proceed from one cell, every one of these passes into, or is continuous with, a nerve-fibre.

"3. The nerve-fibres, or processes, are structurally continuous with the nerve-cell, and they are, as it were, drawn out from it.

"4. The fibres proceeding from a nerve-cell pursue opposite directions, and although two fibres may run parallel to each other, or one be coiled round the other, for a certain distance from the cell, they soon diverge and pursue *opposite* directions.

"In the nerve-centres of vertebrata there are two distinct classes of nerve-cells—1, spherical or oval cells; 2, angular or stellate nerve-cells.

"The first class are found in all the sympathetic ganglia, in the ganglia on the posterior roots of the nerves, and in the cerebellum.

"The second class are found in the brain, medulla oblongata, and spinal cord.

"In the lowest animals, spherical and oval nerve-cells are alone found, and in the lower vertebrata the caudate nerve-cells are small and few in number."—(*Med. Times and Gaz.*)

"*Influence of Vaso-motor Nerves over Secretion.*—M. Brébant, of Reims, has put forward a theory of the relative action of the sympathetic and ordinary nerves, which is different from that of M. Bernard, and which seems plausible enough at first sight. Taking the submaxillary gland as an illustration, he says this organ is provided with two distinct sets of nerves; the chorda tympani, and the filaments of the sympathetic system. The sphincters of the vessels of inosculation obey the chorda tympani, and those of the capillaries obey the sympathetic. If no excito-motor action excites the chorda tympani, the vessels of inosculation remain open, and the blood passing from one set of vessels to the other does not enter the minute capillaries; consequently there is no secretion: the gland remains inactive. If, on the contrary, says M. Brébant, the chorda tympani is called into action, it produces contraction of the sphincters of the inosculating vessels, and these latter being closed, the blood flows on to ultimate capillaries, and thus secretion takes place."—(*Lancet.*)

"*Local Anæsthesia in Veterinary Surgery, etc.*—We announced several months ago that Dr. Richardson's method of producing local anæsthesia by ether spray had been applied with remarkable success for the performance of painless surgical operations on the horse, and on other of the inferior animals. In accordance with its legitimate function as a public body, the Royal Society for the Prevention of Cruelty to Ani-

mals has, we are glad to see, considered the subject worthy of its serious consideration. On Tuesday last Dr. Richardson met the committee of the Society by appointment, and after demonstrating local anæsthesia and performing experiments on himself, Dr. Sedgwick, and Dr. Fraser, proceeded to read a report on the operations which had been painlessly conducted on the horse and on other of the inferior animals. The operations of nerving, of firing, of removing tumors, of castration, and of applying caustics to open and irritable surfaces, were all, the author showed, easily and readily performed under local anæsthesia; indeed, he maintained that if the members of the community demand it, every animal so valuable to man as to be considered the proper subject for a surgical operation may now be subjected to such operation without any physical suffering. A very interesting point was also brought forward by Dr. Richardson, having reference to the degrees of common sensibility possessed by different animals, as shown by the readiness with which their sensibility was capable of extinction on one uniform process of experiment. It was explained that no two animals possess the same degree of sensibility, and that no animal has so distinct and high a degree of sensibility as man. After man, the horse, among the domestic animals, is most endowed, and after the horse, the dog and the guinea pig. Rabbits have a low sensibility. Descending to animals much lower in the scale of creation—viz., to frogs and leeches—the diminution of sense power is so marked that hardly a comparison can be instituted between them and man. Professor Tuson, of the Royal Veterinary College, having been called upon by the chairman, gave striking and valuable corroborative evidence of the complete success of the local anæsthetic process in cases of firing. He had seen as many as forty lines cut in the leg of the horse with the actual cautery, without any indication of pain. He believed that in veterinary surgery the use of the ether spray was not only a means of preventing pain, but an economy to the operator."—(*Med. Times and Gazette.*)

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"*Hypodermic Use of Morphia as Anæsthetic in Operation of Lower Jaw.* By Robt. F. Carlin, M.D., Memphis, Tenn.—Henry Axtell, private, 94th Regiment, Illinois Infantry, aged eighteen years, wounded in the action at New Hope Church, Georgia, May 27th, 1864.

"Nearly the entire lower jaw was torn into fragments by a piece of shell. The inferior maxilla on the right side, to midway between the symphysis and left angle, was completely comminuted, portions of the bony fragments being adherent to the shreds of soft parts that were hanging ragged and loose from the superior portions of the face. On the left side, the ramus and the rough, jagged remnant of the body of the bone remained in position; the under surface of the tongue was considerably lacerated. Sufficient power of deglutition remained to enable him to swallow a little fluid, although the effort was attended with a great deal of pain. He had a nervous temperament, was delicately organized, and extremely sensitive.

"As it was impossible to administer chloroform, and any operation for his relief would be necessarily tedious, I hesitated awhile to consider the best course to pursue. I had heard of the hypodermic syringe, but had never seen it used; it occurred to me that here was an opportunity of testing its power. Having procured the syringe from Surgeon Caldwell, I made a solution containing nearly a grain of the muriate of morphia,

and injected it into the cellular tissue over ramus of the jaw on the right side, and the injection was followed in from three to five minutes by complete insensibility to pain.

"The tongue being held forward with a tenaculum in the hands of an assistant, I commenced by dissecting out all the fragments of bone adhering to the soft parts. The next step was to saw off, with a Heys' saw, the rough, sharp end of the bone on the left side; after which the soft parts were drawn together by interrupted silk sutures, the edges, in some places, being pared or trimmed. (Silver wire or twisted sutures would have been used, if the material could have been obtained.) The fragment containing nearly all of the lower lip was drawn up, and restored the mouth to nearly its natural shape. Between thirty and forty stitches were used, and when the stitching was completed, a face of fair shape and proportions was presented.

"About two hours were consumed in the operation, and during all this time the patient did not manifest the slightest symptom of pain or uneasiness; and whenever spoken to he would immediately answer rationally, with an affirmative or negative shake of the head; and without any hesitation, he would comply with any request to change his position. I was profoundly astonished, and frequently stopped to ask him if I was giving him pain, but he invariably shook his head, *no.*

"Bandages were applied while he was in the sitting posture; and after I had finished he could articulate, but very indistinctly. Before leaving the table, he wrote his name, rank and regiment on a piece of paper. Early on the following morning, being ordered to follow my command, which was moving, I left my patient in charge of others, with a particular request that every possible attention would be paid to him, as the case was one of unusual interest.

"I subsequently learned that he lived four days after the operation; his death, in all probability, being proximately caused by inanition; it was impossible, under the circumstances, to obtain and administer fluid food of a nourishing and stimulating nature.* And although the result in this respect was not as gratifying as we would wish, yet as an illustration of the efficacy of the hypodermic use of morphia, in operations wherein chloroform or other anæsthetics are inadmissible, I regard it as very encouraging."—(*Southern Jour. Med. Sciences.*)

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"*Transverse Compound Fracture through both Upper Maxillæ.*—A young man was admitted lately, under Mr. Hutchinson's care, into the London Hospital, with a very rare form of fracture of the upper jaw. His head had been jammed between a 'lift' and a cross-bar, and probably one part twisted on the other. On admission he had copious bleeding from his nose and mouth, and his eyelids were ecchymosed, leading to the suspicion of fracture of the anterior part of the base of his skull; but on passing the forefinger into the mouth, Mr. Hutchinson found a transverse fracture, which would admit the end of his finger, passing right across both upper maxillæ from side to side, and communicating with the nose and both antral cavities. The alveolus, containing all the teeth, was completely separated and depressed about half an inch, but was loose and could be easily lifted into place.

* When food cannot be readily introduced into the stomach, life may be sustained by injections of nutrient matter into the bowels.—Z.

"Various plans suggested themselves as regards retaining the bone in place, but Mr. Hutchinson contented himself with simply bandaging the lower jaw firmly against the upper one, as this procured very fair apposition. A wedge of gutta-percha was placed between the molar teeth on each side.

"In a few days an abscess formed in the left cheek and was opened. He is doing very well, and there seems every probability that no exfoliation will take place, and that all the teeth will be saved.

"It will be seen that the fragment detached by the line of fracture comprised the entire alveolus, with all the teeth on both sides and the whole of the hard palate. Probably it included also the lower parts of the pterygoid processes, but this point was not ascertained positively. Above the line of fracture the thin plates of bone were much comminuted, and probably the left orbit was involved."—(*The Med. Press and Circular.*)

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"*Case of Facial Paralysis.* By John H. Gilman, M.D., Lowell.—December 10th, 1866.—D. W., aged 39, overseer of a weaving-room on the Suffolk Corporation, while inspecting some cloth, observed that he could not close his left eye, and soon after that he had no use of the same side of his face. He directly applied to me to inquire what had befallen him, and, on examination, there was found to be complete paralysis of the portio dura. At this time he did not seem inclined to pursue the treatment advised, and went away.

"Dec. 17th.—The patient came to me again, fully prepared to pursue the treatment recommended. He is a man of lymphatic temperament, and somewhat corpulent. The paralysis came on without any obvious cause, unless it resulted from a carious bicuspid tooth in the lower jaw of the paralyzed side. The tooth had been filled with amalgam about a month previously, and it gave him so much pain that he went back with the intention of having it extracted; to this the dentist objected, and drilled a hole in one side of it and destroyed the nerve. After this, the tooth gave more or less uneasiness until about a week before the occurrence of the facial palsy. The tooth was at once extracted, and found to have undergone partial absorption at the root, and emitted a most offensive odor.

"*Treatment.*—The patient was advised to abstain from alcoholic stimulants and tobacco, and to partake of less food than usual. He was allowed to pursue his vocation without interruption. Magneto-electricity to be applied daily for three-quarters of an hour, by means of Davis and Kidder's machine. Wet sponges were put into the cylindrical excitors, and one was carried over the paralyzed part of the face, and the other was placed behind the left ear during the first half, and behind the right during the last half of each sitting. The orbicularis palpebrarum and the occipito-frontalis responded quickly to the electric stimulus, but the facial muscles did so less sensitively, especially the buccinator, which was quite feeble in its response. A blister was applied behind the left ear. A solution of strychnia was given every three hours during the day. The bowels were acted upon by the compound cathartic pill.

"Dec. 20th.—Increased the dose of strychnia to one-twelfth of a grain. Applied a blister behind the right ear.

"24th.—Can partially cover the eyeball with the lids. Increased the dose of strychnia to one-tenth of a grain. Applied a blister behind the left ear.

"27th.—Can move the cheek a little, and has occasional twitchings of the muscles. Applied a blister behind the right ear.

"30th.—Can meet the lids over the eyeball. The muscles of the face have recovered their power, insomuch that the patient can spit, whistle, and converse without much difficulty.

"Jan. 2d, 1867.—Strychnia discontinued. Electricity to be applied every two days. Patient improving.

"7th.—Patient has recovered full use of the paralyzed part. Treatment discontinued."—(*Boston Med. Journ.*)

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Causes and Treatment of Glossitis. By HENRY GRAY CROLY.—"The following are the *causes* of glossitis mentioned by authors:

"1. Exposure to wet and cold (the idiopathic form).

"2. Mercurial salivation.

"3. Erysipelas spreading through the mouth.

"4. Variola, or other eruptive diseases.

"5. Stings of wasps or other venomous insects (in fruit season).

"6. Wounds of the tongue, such as bites during mastication, or epileptic paroxysms.

"7. Burns and scalds.

"8. Incautious or accidental mastication of acrid or irritating substances, as briony or wild rice, the mandragora, the aruna, and other poisonous plants. (Copeland saw a case of diffuse asthenic glossitis caused by masticating monkshood through accident.)

"9. The excessive use of tobacco.

"10. Caustics, acid and acrid chemical compounds. (Hot articles of diet.)

"11. Operations on the teeth, or for ranula.

"12. The administration of mustard has produced it when given in cases of poisoning.

"13. Suppression of the menses or other accustomed discharges.

"I may here mention that the idiopathic appears to be the most frequent variety of the disease, though generally considered to be very rare. Six of my seven cases were purely of that type, and all of Dr. Geoghegan's were of the same nature. Young and healthy men are most prone to this form of the affection, and the inflammation is most frequently *sthenic* in its character. When produced by excessive mercurial action, or suppression of the salivary flux, there is generally much *more tumefaction* than actual inflammation of the organ.

"When glossitis occurs as a complication of erysipelas, smallpox, scarlatina, or pestilential maladies, the inflammation is of the *asthenic* type; the symptoms are urgent, and the progress of the disease is rapid; pain and tumefaction are great, and the inflamed parts become livid; the fever is characterized by vital depression, quick and weak pulse, etc.; and the variety caused by animal poison or stings of insects often ends in gangrene.

"Unlike in its prominent features to other diseases, I do not think it necessary to dwell on its distinguishing features, as I assume no practical surgeon could be mistaken in the diagnosis. From the extreme vascularity of the tongue, and its distensible covering, the organ is liable to swell to an enormous size with great rapidity, and hence the term *erectile glossitis.* When the tongue suppurates, the disease is called *suppurative*

glossitis (non-frequent, perhaps, when one side only is engaged), while the form produced by mercury is called *murcurial glossitis.*

"The following are the most prominent symptoms, constitutional and local: Rigors, pyrexia, headache, soreness in the throat (a symptom almost invariably present), anxiety, and turgescence of countenance; difficulty and pain in swallowing; unquenchable thirst; flow of saliva or mucous fluid; enlargement of sublingual glands; swelling and tenderness about the throat and beneath the lower maxilla; thickness of speech; peculiar voice, pain, redness, swelling, and occasionally protrusion of the tongue and great enlargement of the papillæ; the tongue is more frequently *protruded* from the mouth in the sympathetic forms proceeding from the excessive use of mercury, when the simultaneous affection of the tonsils, parotids, and parts in the vicinity, and the consequent tumefaction of them, press the organ outward (in proportion to the swelling are the functions of the organ impaired, and in severe cases the voice and speech are much affected); indentation of its edges from the teeth; viscid exudation on its anterior surface. The swelling is best marked toward the base of the tongue and at one side only; the swelling occasionally prevents the epiglottis from rising, and fills up the mouth and isthmus faucium so as to threaten suffocation.

"At the commencement the sense of taste is very acute, owing to the excited state of the nerves and increased vascularity of the papillæ; but as the disease proceeds taste is partially destroyed, owing to the pressure on the nervous fibrillæ from the turgid vessels and fluid effused into the structure of the organ, and partly to the thick mucus or lymph covering the inflamed surface.

"Inflammation of the tongue may terminate in resolution, suppuration, suffocation, or sphacelation.

"Abscess in the tongue is said to be rare, owing probably to the muscular structure of the organ. In consequence of the effusion of lymph into the substance of the tongue considerable *hardness* and enlargement sometimes remain long after the acute stage of the disease has been subdued.

"N.B. Protrusion of the tongue prevents dyspnœa, as it allows the mouth to remain open.

"*Treatment.*—Leeches to the upper surface of the tongue (the organ having been previously well dried); the bleeding from the leech bites to be encouraged by the patient washing out the mouth frequently with warm water; punctures with a lancet beneath the tongue (Velpeau speaks of puncturing the ramid veins); the administration of a purgative and an antimonial mixture when the inflammatory symptoms are high. If the case has not been seen in its early stage, and the symptoms are urgent, no time should be lost in making a free and deep longitudinal incision at either side of the raphe, commencing sufficiently *backward*, and keeping the edge of the bistoury parallel with the septum to avoid the possibility of injuring the vessels. There is another caution necessary in incising the tongue—the œdema may so far involve only one side, as to cause the *lower* surface, which yields the more readily, to be turned directly *upward*, in which case the incision made *above* passes into the tissues *normally inferior.* The hæmorrhage from the engorged organ is very considerable, and sometimes alarming to the patient and surgeon, but in the majority of cases it ceases very soon; if the patient be feeble a pledget of lint introduced into the wound will have the desired effect, and

was resorted to in one of my cases. Pieces of ice, if at hand, would be of much service in such a case. I find incisions were first recommended by Job Meckren, in the year 1656. They never fail in affording a speedy relief when made sufficiently deep and far back. The incisions gape widely at the time, but in a few hours close, and appear to be mere scratches, and sometimes it is difficult to see them on the following day. I observed in one instance that the wound reopened.

"My friend (and former pupil) Dr. Usher, of Tinahely, lately informed me of a case of glossitis which occurred in his neighborhood; incisions were recommended, but the man refused to submit to the treatment, and died from suffocation.

"In a case when the symptoms are too urgent to admit of waiting for the effects of incisions, tracheotomy should be performed without delay.

"The patient's strength should be supported by beef-tea, milk, and other unstimulating nutritious articles of diet."—(*Med. Press and Circular.*)

"*Sequelæ of Surgical Operations.*—M. Maisonneuve thinks that of every hundred patients who die after surgical operations at least *ninety-five* are poisoned. This he explains by showing that in most cases of the kind referred to, certain morbid products, the result of the operation, are developed either in the blood or on the surface of the body, and make their way into the system. He formulates his remarks thus: (1) The blood and other animal fluids, when exposed freely to the air, or in contact with aqueous substances, soon lose their vitality. (2) Once dead, they are liable to putrefy under the influence of heat, moisture, and air. (3) The products of such putrefaction are highly poisonous. (4) It is the same with such secretions as the urine, bile, and intestinal juices. (5) In infiltrating the permeable tissues with which they are in contact, these poisoned liquids give rise to gangrene, erysipelas, etc. (6) These same liquids, either by themselves or mixed with the special products of inflammation they provoke, can, in entering the circulation, alter the blood and disturb important functions. (7) After their expulsion from the general blood-vessels they may remain in the capillaries, the parenchymata, serous tissue, etc., and give rise to abscess, anthrax, etc. (8) The entirety of the disturbances constitutes surgical fevers. To prevent these terrible consequences of operation, M. Maisonneuve suggests the adoption of the subcutaneous method, and the employment of all means of preventing putrefactive processes."—(*Lancet.*)

"*Influence of Alcohol on Temperature of Non-Febrile, and Febrile Persons.*—When taken in ordinary quantities by the former, it causes a slight depression of the temperature; the amount, however, is too small to contraindicate its use. In the febrile, it causes only a slight and temporary depression, even when given in extraordinary quantities, consequently, alcohol cannot bring the temperature of febrile patients to that of health."—(*Uns. Journ. of Med. and Surg.*)

"*Effects of Alcohol.*—Experiments made by Drs. Ringer and Rickards on men and animals go to show that the temperature of the body falls nearly as fast after the use of alcohol in doses sufficient to produce intoxication, as after death itself. The facility with which drunkards freeze to

death, is explained by this fact. Dr. Jolly declares that an increasing tendency towards mental disease has been generated by the increasing consumption of spirits. Official reports show that the abuse of alcohol accounts for one-fifth of the insanity in France."—(*Sci. American.*)

Physiological Effects of Alcohol.—At a late meeting of the Medical Society of Newcastle-on-Tyne, Mr. T. H. Pyle read a paper on this subject. "His object being to show that the theory of Liebig as to the decomposition of alcohol in the system, and its subsequent contribution to animal heat, was untenable. Mr. Pyle in his paper related a post-mortem, conducted by himself and assistant, of a man run over by an engine after leaving a public-house. 'The calvaria being removed, we were astonished at the powerful odor of whisky which the membranes emitted, and which increased as we proceeded to cut into the substance of the brain. There was some fluid in the lateral ventricles which appeared to be more transparent than serum, and which burned with a blue flame and had all the characteristic properties of alcohol; the whole brain was congested and saturated with spirit, and even the water in which I washed my hands retained the effluvium for several hours afterwards.'"—(*Lancet.*)

"'*Glyconine*'—*a new Glycerole?*—To obtain this compound, M. Edmond Sichel employs 4 parts (by weight) of yolk of egg, and 5 parts of glycerin, which he mixes simply in a mortar. It has the consistence of liquid honey, and is unctuous like the fatty substances, over which it has the advantage of being easily removed by water. It is unalterable, a specimen having been left exposed to the air for three years with impunity. Applied to the skin, it forms on the surface a varnish, which protects it from the contact of the air. These properties render it serviceable for broken surfaces of all kinds, particularly for burns, erysipelas, and cutaneous affections, in which it soothes the itching, and also for sore nipples; its harmlessness prevents, in the latter case, any interruption of suckling."—(*Journal de Pharmacie*, from *Bulletin de Thérapeutique*, and *Amer. Jour. Pharmacy.*)

"*Hypochlorite of Magnesia in Bleaching.*—The following has been discovered in an examination of the action of hypochlorite of magnesia, and the preference which is given for it when delicate tissues have to be bleached: 1. This hypochlorite decomposes more easily than the lime compound. 2. The liberated magnesia is without action on the tissue. This cannot be said of lime. The best way of preparing hypochlorite of magnesia consists in decomposing sulphate of magnesia with hypochlorite of lime. When the sulphate of magnesia contains manganese, the liquid assumes a red color, and loses its bleaching power."—(*MM. Bolley and Jokisch, in Schweiz. Polyt. Zeitschr.*, and *Chemical News.*)

"*To copy Manuscripts.*—The following method for obtaining copies of manuscript papers will be of great service to those who wish to preserve copies of what they write: 'Put a little sugar in common writing ink, and with this write on common paper, sized as usual. When a copy is required, take some unsized paper and moisten it lightly with a sponge, and apply the wet paper to the writing, and pass lightly over the unsized paper a moderately heated iron, and the copy is immediately reproduced.'"—(*Amer. Artisan.*)

"*Converting Electro-Magnetic Engine.*—We learn that Mr. Siemens and Professor Wheatstone have simultaneously produced, before the Royal Society, similar machines realizing the conversion of mechanical into electrical force with remarkable perfectness and almost a minimum of loss. Mr. Siemens' converter consists of a bar of soft iron with a very slight initial magnetism, aided by the small mechanical force required to rotate it within an envelope of copper wires laid parallel to its axis. The electricity thus excited by the slight initial magnetism of the iron, excites the magnet in turn, and this reciprocal excitation goes on in unlimited progression. In the miniature experiment shown, the magnetism developed surpassed the strength of two men, and the heat of the electrical current was sufficient to melt iron wire. The power required being so trivial, and the movement so simple and frictionless, it would seem that these striking results might well have approximated closely to an equivalent for all the mechanical power expended. This is a great result in its practical bearings, particularly on the advantageous conversion of mechanical power into light. Our present mode of getting light (to illustrate grossly) is like keeping up a bonfire or heating a furnace merely to read by. We throw away the most of our light-fuel in the form of heat, which, if converted into steam power and that power passed through electro-converting engines and issued in electric light, might be almost adequate to turn the night into day. It ought not to be long, indeed, before night will become merely an optional indulgence."—(*Sci. Amer.*)

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Alloys.—In a lecture before the London Chemical Society, "Dr. MATTHIESSEN commenced by defining an alloy to be 'a solidified solution of one metal in another.' The metals might be conveniently divided into two classes, according to whether or not certain physical properties of the constituents reappeared in the compound. The metals in the first class (A) were lead, tin, zinc, and cadmium; in the second class (B), all the rest. If either of these four metals were alloyed among themselves, the metallic mixture always presented physical characters, which were the mean, by weight or volume, of the component metals. Zinc and lead would not unite to form alloys, or only in minute proportion could one metal be dissolved in the other; thus lead was saturated by 1·6 per cent. of zinc, and, conversely, zinc by about 1·2 per cent. of lead. If equal weights of the two metals were melted together and allowed to cool very slowly in a cylindrical mould surrounded by hot sand, the separation was almost complete, the heavier lead subsiding to the bottom. The case of zinc and bismuth was somewhat similar; only 2½ per cent. of zinc could be dissolved in bismuth, while a variable quantity, from 8 to 14 per cent. of bismuth was taken up by zinc. Alloys did not, in the lecturer's opinion, come within the definition of true chemical compounds, but were intimate mixtures, perfectly homogeneous throughout, like ordinary glass. There might be a few exceptional cases, such as the sodium amalgam, in the production of which heat was given out, so also with platinum, or gold and tin; but the addition of lead to melted tin had a cooling effect, and copper dissolved but very slowly in the latter metal, although the copper-tin alloy had new and remarkable properties. Dr. Matthiessen then proceeded to illustrate by experiment the fact of the specific heat of the copper-tin alloy being the mean of the specific heats of the metals composing it. For this purpose two short cylinders were taken; one

was the copper-tin alloy (gun-metal), and the other a compound bar of the same weight, made up of a cylinder of copper joined to one-tenth of tin. These were suspended by strings in boiling water, and heated together for a few minutes, then withdrawn and cooled in two identical cups of cold water. By a differential thermometer, in the shape of the letter M, the rise in temperatnre of the water was shown to be in both cases exactly equal. A similar experiment, made with lead and zinc of equal weights, at once indicated the fact of the specific heat being greater in the case of zinc. The rate of expansion by heat was shown by a modification of Daniell's pyrometer, the gun-metal and compound copper and tin bars being surrounded by a glass tube charged with steam. In both instances the needle was deflectedto the same extent. The lecturer then referred to the crystalline form and fusing points of alloys; these were characters upon which the chemical view had usually been based, but a lower fusion temperature was common to all mixtures. Thus the alloy of potassium and sodium was permanently liquid like mercury, a mixture of their chlorine compounds, or, indeed, of any two metallic chlorides fused lower than the mean temperature; so also did the mixed fluxes employed in metallurgical operations. Mr. Cooke has stated that alloys of antimony and zinc, containing from 43 to 64 per cent. of the latter, crystallize in a different form from all the rest. The same had been said of the gold-tin alloy containing from 27 to 43 per cent. of gold. With regard to the copper-zinc alloys, the lecturer said that they all crystallized in the same form, and that therefore definite forms could be obtained when the constituents were not in atomic proportions. The properties of heat and electric conduction were next treated of; these were said by MM. Wiedeman and Franz to be alike. A comparative experiment was then shown, which indicated how rapidly the conducting power of copper for heat was destroyed by the introduction of a metal of Class A, such as tin, while the lead-tin alloy presented the mean result of the component metals. The results were as follows:

	Heat-conducting power.
Copper	100
Copper-tin alloy	8
Tin	12
Lead-tin alloy	11
Lead	8

Several very interesting observations were brought forward by Dr. Matthiessen in connection with electric conductivity of alloys. The metals of Class A are all bad conductors, and when alloyed with each other they conduct electricity in the ratios of their relative volumes. (Indicated by straight lines in the diagram.) Metals of Class B, such as gold and silver, do not, when alloyed with each other, conduct in the ratios of their relative volumes, but always in a degree inferior to the calculated mean. (Shown in the diagram by a rapid decrement on *both* sides of the curve.) The alloys of metals in Class A with one of those in Class B (for example, the copper-tin alloy) are like the last, but they show a very rapid decrement on the side of the metal belonging to Class B (to the extent of 85 per cent. copper in the instance quoted), then running in an almost straight line to the other side, representing the metal (tin) of Class A. In other words, there is very little difference between the conducting power of gun-metal and of pure tin, although copper itself is eight times

better than tin. The sonorous qualities of metals and alloys were next taken into consideration. Bars of copper, tin, and a tin-copper alloy, when struck, all emitted a dead sound, but gun-metal gave a clear ringing tone. Brass rings well, but zinc is dull. Steel is infinitely superior in sonorous quality to malleable iron. Elasticity was then exemplified by hanging weights to a series of metallic wires twisted in a spiral form. Copper was straightened by a weight of 500 grammes, and tin by 50 grammes; but the copper-tin alloy supported the 500 without loss of figure. The difference between pure gold wire and gold with copper was very marked; so also the silver-platinum alloy proved greatly superior in elasticity to either of the individual metals. Spirals of hard-drawn malleable iron and steel showed, of course, the extremes, with least variation in chemical composition. Tenacity was shown by the help of a draw-bench with spring balance attached. The experiments had to be rapidly performed, and the results were only true, therefore, between somewhat wide limits. The breaking weights of wires of equal diameter, 23 wire gauge (Birmingham), were nearly as follows:

Copper wire, hard drawn		about 30 lbs.
Tin		under 7
Copper-tin alloy (hard-drawn)		80 or 90
Tin-copper alloy		about 7
Lead		under 7
Lead-tin alloy		about 7
Gold	(hard-drawn)	25 or 30
Gold-copper alloy	"	80
Silver	"	about 50
Platinum	"	" 50
Silver-platinum	"	" 80
Iron	"	about 80 or 90
Steel	"	upwards of 200

The lecturer proceeded to show how completely the scientific deductions coincided with the results of practical experience; thus the 'turning-points' indicative of marked physical properties were found to mark the proportion of metals entering into the composition of a variety of useful alloys. Thus, in

Brass, 28 per cent. of zinc.
Gun-metal, 12 per cent. of tin (approximately).
Gold of 22 carat standard (with copper).
Dental alloy of silver and platinum.

The last-named alloy had been chosen as the standard for electrical resistance by the British Association Committee. The sound and electrical curves differ only by 5 per cent. in the case of the copper-tin alloy, and other physical characters are marked in gun-metal, but the lecturer hesitates to accept the expression $Cu_{14}Sn$, which would be demanded on the assumption of its being a chemical compound. While the metals of Class A produce alloys having normal physical properties, those of Class B are so entirely changed by admixture of small quantities of other metals that the resulting alloys can only be viewed as 'solidified solutions of allotropic modifications of the metals in each other.' Dr. Matthiessen concluded by referring to the discovery of a new factor, which, if

multiplied by the number representing the conducting power of a metal alloyed with it, expresses the electric value of such metal in the alloy."—(*Chem. News.*)

"*Alloys of Steel with Platinum* are said to be very perfect in every proportion that has been tried. The best proportion for edge instruments is about 1·5 per cent. of the latter metal. Equal parts by weight form a beautiful alloy which takes a fine polish and does not tarnish: the color is the finest imaginable for a mirror."—(*Sci. Amer.*)

Sand Bricks—In reply to an inquiry for a method of making substantial brick of sand, a correspondent of the *Scientific American* says: "Two parts of potash, soda, or other alkali, to one of sand, fused, will then dissolve in water, making soluble glass. To this add sand, *quantum sufficit*, and press into moulds of required shape. This will make a hard vitreous brick or cement."

BIBLIOGRAPHICAL.

The American Naturalist. (*A Popular Illustrated Magazine of Natural History.*) Published by the Essex Institute, Salem, Mass. Three dollars per annum.

This is a new and handsomely illustrated monthly, devoted to popularizing "the best results of scientific study," in natural history. The character of its contents, which are varied and instructive, may be estimated by the interesting extract from the history of the snail, we transfer to our pages. It is a meritorious publication worthy of a large circulation and liberal support. We commend it to our readers, and exchange with pleasure.

An Inquirg into the Origin of Modern Anæsthesia. By the Hon. Truman Smith, Member of the United States House of Representatives for the 26th, 27th, 29th, and 30th Congresses, and of the United States Senate for the 31st, 32d, and 33d Congresses. Hartford: Brown & Gross, 1867.

In this work Mr. Smith gives a very interesting history of the origin and discovery of anæsthesia. He presents therein conclusive proof of the discovery by Dr. Horace Wells, by priority of conception, priority of experimentation, priority of verification, and priority of application of anæsthesia in general, as well as dental surgery. He, moreover, adduces evidence to show that Wells not only thus first demonstrated the practicability of anæsthesia with nitrous oxide, but also that he and his friends employed for the same purpose sulphuric ether, and after an experimental test of the relative merits of the two anæsthetic agents, preferred the former long before the investigations of his opponents.

The value of the book is greatly enhanced by a fine engraving and a brief biographical sketch of Dr. Wells. This work constitutes a valuable addition to the literature of dentistry, and of general science, as it affords information of especial interest to all students of progress and lovers of truth.

THE

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ORIGINAL COMMUNICATIONS.

DENTITION; ITS PATHOLOGICAL AND THERAPEUTIC INDICATIONS.

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(Continued from page 523.)

As this would prove totally irrelevant to the matter under consideration, suffice it to say, that the usual treatment for constitutional syphilis is administered, which will be dwelt upon in another part of these papers when directing attention to the cause, medication, etc. of this disease; the course to be pursued, however, with the infected infant after birth is interesting in this connection, and will demand a brief examination.

As soon as possible after the child is born it should be taken from the mother and intrusted to the care of a sound, healthy wet nurse, since a total isolation from the mother, as a source of nourishment, is essential to its preservation. If, however, this be not practicable, the milk of the ass proves the best substitute, as it approaches nearer to the human milk in most respects than that of any other animal.

If, again, this cannot be obtained, fresh cow's milk is always abundant, and easily procured; but, in connection with this change of regimen, a close adherence to hygienic rules is indispensable, as an abundant supply of fresh air, judicious exercise (such as rolling upon the floor), warm flannel coverings for the body and limbs, and frequent ablutions with tepid water, with which may be mixed bran or mucilage, especially if eruptions, fissures, or ulcers be present upon the skin. In connection with these measures, cod-liver oil has been regarded an invigorating adjunct when the stomach will tolerate its presence.

The internal remedies, upon which we almost exclusively rely, are the

preparations of mercury, which so invariably control these cases as to have received from many the title of "specific;" the form in which it is mostly exhibited is that of the bichloride, in doses ranging from the fortieth to the fiftieth of a grain three times a day, dissolved in distilled water, syrup, or, if a tonic is required, in a few drops of Huxham's tincture of bark. This treatment should be persevered in for many weeks (occasionally, however, omitting a few days), not only until the disease has disappeared, but for some time after, and, with the view of its entire eradication, it has been advised to periodically resume medication until the child is several years of age.

In obstinate cases, it is suggested to combine with the bichloride, the iodide of potassium, in the proportion of the quarter or eighth of a grain with each dose; when the body is disfigured and painful from sores or pustules, it has been advised to submit the little patient to a course of mercurial fumigation, being careful to avoid the induction of debility and the dangers of suffocation. The propriety of resorting to this measure, however, must be questioned, while the results derived from mild dressings of weak oxide of zinc or nitrate of mercury ointment, in conjunction with the above remedies, are regarded advantageous.

In cases where the bichloride will not be tolerated, trial may be made with mercury and chalk, or, what is considered better, inunction with mercurial ointment, from a half to one drachm, rubbed upon the inside of the thigh once a day, being covered and retained by a piece of flannel. This, like any of the various plans of treatment proposed, should be persevered in until all indications of the disease have vanished.

Let us here leave this subject, which is extensive and fraught with much interest; but permit me, before going further, to remark that we will first notice the causes that may and do tend to derange dentition, of which the affection just considered forms one; next, refer to those affections credited to dentition as their origin, and give the most approved methods of removing the cause.

Independent of any absolute specific taint, a child may, through the feebleness of one or both parents, or the existence during its embryonic condition of some debilitating maternal disease, be born feeble, and with a constitution far below the average strength; consequently deficient vitality implies a lack of pabulum for the building up of the economy, and, of course, from this dearth of material, the jaws and teeth must suffer in quantity, quality, or form of tissue, or in all combined, and the latter erupt at periods irregular and in manner abnormal.

This depraved condition of the body is known by the term cachexia, or "bad habit," and is very frequently modified in its tendencies by the existence of certain diatheses or predispositions, which determine the form of its manifestation. The first of these which we shall notice as injuriously affecting dentition, is cachexia scrofulosa, or the *strumous*

diathesis, characterized by depositions in various localities, tending to extensive degeneration of their own and the adjoining structure, and exhibiting one of two forms, "either that of small isolated bodies or that of irregular infiltration into the tissues."

The two extremes of life are regarded as the least subject to this disease, being rare, according to the authority of M. Papavoine, before the end of the second year, more frequent from then to the end of the fourth year, and exceedingly so from then until the end of the thirteenth year, or about the time of puberty, which temporarily barricades its progress; to liberate it again after a short imprisonment, whence it continues to flourish until the age of thirty-five or forty, henceforth declining, so as to be exceedingly rare in old age.

Much importance has been attached to the color of the complexion, hair, and eyes, as denoting a strumous tendency, signs whose value stands denied upon the authority of some of our ablest physicians. Dr. Wilshire, however, has called attention to a very hairy condition of the skin in children, particularly on the forehead, arms, back of the neck, and between the shoulder-blades, as peculiarly indicative of a tubercular predisposition.

Says Dr. Wood: "More confidence may be placed in the signs which indicate a commencing development of disease, and which often long precede the deposition of tubercle. Such are a pale, somewhat puffy countenance, swollen lips, which are apt to be sore and chapped in cold weather, tumefaction about the nostrils, occasional purulent discharges from the nostrils or ears, a tendency to soreness of the eyes, and especially to a vesicular eruption upon the conjunctiva, vesicular eruptions behind the ears and on different parts of the head and face, sourish and otherwise disagreeable exhalations from the skin, slight swelling and induration of the glands of the neck and enlarged tonsils, a rickety condition of the bones, a weak but excitable pulse, flabby muscles, a rapid increase in height without corresponding lateral development and general weakness indicated by fatigue after moderate exertion." Of course, this great variety is not found in every case, yet a sufficient number are present to awaken suspicion and occasion the adoption of prophylactic measures.

The lungs and lymphatic glands are decidedly most prone to attacks of this disease; when the latter are implicated, the diagnosis between scrofulous and ordinary chronic inflammation of the glands is indicated by their greater solidity, less sensibility upon pressure, their slow progress and obstinacy in resisting treatment—these, coupled with the presence of other scrofulous affections, or the knowledge of an hereditary influence, will be sufficient to determine their nature.

The influence of struma in deranging the osseous or dental tissues has been considered very remote, and Rokitansky, in a classification of parts, numbering 15, according to their liability to tubercle, places the bones

and periosteum number 11 in the scale; yet it is unquestionable that it is powerful in the aggravation of diseased conditions, from the nullification of the reparative process, and consequently will, upon the slightest provoking causes, occasion the most serious results, such as extensive ulceration of the gums and exfoliation of the alveolar process.

Now, where scrofula is present, or even suspected, it becomes the dentist to know its pathognomonic indications, although it may not fall within his province to treat it, unless it eludes the scrutiny of the general practitioner, and is exercising an injurious influence upon dentition, when I contend it is the duty of a skillful dental surgeon, who appreciates these conditions, to interfere.

With regard to the treatment of scrofulous cachexia, I shall be brief; bearing in mind that the difficulty is constitutional in its origin, the first indication is to address treatment for its correction systemically, rather than adopt any vigorous repulsive measures locally, for this latter practice is regarded reprehensible, from the liability of a translation of the affection to some other and more vital part.

Without enumerating the manifold curative restrictions and indulgences peculiarly hygienic, suffice it to say, that every measure calculated to invigorate the vital forces and establish a permanent tonicity should be prescribed, such as pure air, moderate exercise, nutritious and digestible diet, warm clothing, pleasant mental diversion, salt bathing, etc.

In addition to these means, medicaments called tonics are found valuable in strengthening the impoverished blood; the various preparations of iron are chiefly used, as the powder, carbonate, subcarbonate, iodide in solution, or the tincture of the chloride.

Cod-liver oil has received the credit of unusual efficacy in the correction of the scrofulous diathesis; its administration should be inaugurated with small doses gradually increased to a teaspoonful three times a day, and continued for many months.

In connection with this, as with other diseases, symptoms of a foreign nature often present, and should be treated upon general principles, modified, however, when any peculiarities of the pre-existing malady indicate.

The treatment of external scrofula is dependent upon the stage of the disease; in the early period, revulsive measures are advantageous, mild cathartics being chiefly employed, except when the intensity of the symptoms demand more energetic treatment; when, however, in the advanced condition the system is very much reduced, tonic and stimulant treatment is applicable.

Iodine and the iodides are deemed of great value in the treatment of scrofula, and are exhibited both systemically and locally, with a view to their alterative and sorbefacient effects.

It is essential that the dental practitioner carry in memory the differential diagnosis between simple or specific inflammation of the lymphatic

glands and the enlargement occasioned by the formation of alveolar abscess, in order to avoid the infliction of pain and deformity, so often entailed through ignorance of the distinguishing characteristics; when, however, careful inspection discovers the affection to be entirely innocent of any dental origin, confidence in your ability, as an educated specialist, will oftentimes induce the case to remain with you for treatment.

As already stated, care should be observed to prevent the internal translation of the inflammatory action; when, however, this is considerable in the gland, leeches, and applications of lead in various forms, are advised; if the action be sluggish in its form, and resolving measures are suggested, we may employ "lotions or ointments of iodine, iodide of potassium or of lead, mercurial ointment, common salt in solution or in the form of a cold poultice, and ammoniacal liniments, with advantage, if applied before the deposition of tubercular matter."

When suppuration cannot be avoided, it should be facilitated by emollient poultices, and the pus, when formed, evacuated with a lancet.

Should the abscess degenerate rather than assume a healthy granulating surface, the reparative process may be stimulated by injections; or, if fistulæ be formed, it may be necessary to distend them with the sponge-tent, or even incise them in order to expose the unhealthy portion to direct applications.

Ulcers, when formed, should be treated with mild, soothing dressings; when this proves unavailing, "they may be stimulated by resin cerate, the ointment of red oxide, or subnitrate of mercury, weak nitric acid, and similar applications. The ointment of the iodide of lead has also been very strongly recommended;" if in a fungoid, soft condition, chalk, alum, tannic acid, Peruvian bark, nitrate of silver, and such remedies may be applied; if in a fetid and gangrenous condition, disinfectant agents should be resorted to, as chloride of lime, soda, or zinc, creosote, or the fomenting poultice. It has been recommended to introduce issues or setons in the upper or lower extremities, to act as a constant safeguard against recession of the disease to important viscera, yet the advantages or advisability of such a course do not, I think, stand generally indorsed.

Dr. Simon regards scrofula as dependent upon a condition of the blood in which both the fibrin and corpuscles are below par and decidedly deficient, while the water of the blood is increased; now, since the revival of electricity as a therapeutic agent, it has been, under some circumstances, found quite efficacious in the treatment of this affection, and Dr. Garrett very correctly observes: "Conditions which are so manifestly electro-nervo-pathological, as well as humoral, are known to be, in part at least, *corrected* by means of iron, quinine, phosphorus, and sulphur; or by farinaceous or animal food, exercise, sunlight and air; while very many others are *not quite reached* by air or all these rational, but for the given case, insufficient means, until reinforced by the co-operating and vitalizing in-workings of correctly employed currents of electricity."

PHYSIOLOGY OF THE BLOOD.

BY WM. H. ATKINSON, M.D.

Read before the Society of Dental Surgeons of the City of New York, April 10th, 1867, by appointment, as special essayist.

To enable us to comprehend the function of the blood, which the text signifies, it is incumbent to define not only the action, but the body or substance which acts in elaborating the work.

If we take the largest range of bodies between which a circulation is maintained, we shall have entered the domain of astronomical territories, in which ethereal circulation is the limit of the blood space of worlds, in which resides all the possibilities of form and function of planetary existence and subsistence.

Thus we are able to perceive that we must first define the blood belonging to the body, to which it acts as servant, and out of which the body takes its origin, in order to understand that blood, and every body and substance, is but the limit or degree of differentiation between most indifferenced spirit and most differenced crystal or absolute solid; attempts of each at domination of which produce, in equation of governance, all possibility of substance and form, from seraph to silex, with all intermediates.

Blood, then, in the most general sense, signifies chaos, or formless substance, out of which individual being is produced, and by which it is sustained and empowered to work out the mission of its metamorphoses from inception, efflorescence, and fruitage, to decadence and disruption into its individual constituencies, solid, fluid, gaseous, ethereal, and spiritual.

In fact, the true physiology of the blood is just this round of change between most condensed and most diffused condition of substance, pronounced in the enamel of the teeth and the mucous mass, or amorphous germinal matter, in the juices of the flesh, in all forms of animals, from the simplest lump of jelly (sea-nettle), to radiate, mollusk, and mammal.

The function of the blood of Planets, Plants, and Peoples, is nothing less than a ceaseless series of formation and appearance, metamorphosis and disappearance of substance, as blood, to become every possibility of filament and fibre, tissue and organ, soft and solid, conceived or conceivable by the mind of man, in due co-ordination of electrism, chemism, and magnetism, in every scale and every degree of manifestation of matter and mind, the corelative necessities inhering in substance.

The relations of mind and matter are such that we can only apprehend the one by comprehending the other. The commerce carried on between them is transacted through the medium of the blood, be it colorless, white, red, or black. The purely transparent, ethereal, colorless variety belonging to the planets or heavenly bodies, as parts of the macrocosm or infi-

nite world, whose parts they respectively are, the black to creatures capable of subsisting in the dark, mineral, vegetable, or animal (inhabitants of planets); the intermediates between these extremes, viz., white, red, blue, etc., belonging to crystals of plants and minerals, in which water-, earth-, fire-, and air-processes conspire to produce intimate commingling of what have been called *elements*, capable of thus influencing the light pencil, by which the qualities of appearance become possible of cognition by us. Thus the *blood* of the infinite system of worlds becomes the *breath* of the individual worlds or globes (planets). This is the first metamorphosis of *blood* to *breath* that comes within the range of our present ability of comprehension.

The next step is the antithesis of this, in which the process is reversed, and the *breath* is converted into *blood* proper to the individual system of present or prospective organs, the consentaneous action of which constitutes it an individual system in harmonious equation of all the possible modes of life and motion, belonging to the macrocosm or to the microcosm, which each successive subdivision of the former is to all above it, and which (macrocosm) it becomes to all below it in the great scale of being, in which breath and blood are interdependent necessities of pronouncement.

Levity and *gravity* are only predicable of microcosms, which are endowed with definite centres and surfaces.

Angularity of outline is only possible to bodies occupying fractional dominion or occupancy of space.

Expansion tends to levity; contraction, to gravity.

The tendency to predominance of neural blood is conducive to elevation of mind and body; that of the vascular blood, to stolidity of mind and immobility of body. So the exact equation in alternations of the struggle to dominate keeps up the continuous round of circulation by inspiration, digestion, and expiration in every cell, tissue, organ, and system, by the antagonisms of each being fused into equable health of the whole mind and body.

Does any one say, "This being so, pure blood would produce pure life, and this must annihilate death and make life perpetual?" My reply is, The conception is in itself not only the *prophecy*, but the *proof*, that it is possible, and will certainly come to pass just when the conditions of an absolutely pure and perpetual obedience to the laws indicated shall have been attained.

Affete and effete conditions correspond to and indicate oxidation and carbonization of the blood column. Oxidation producing and intensifying vivific currents of normal affinities; carbonization deflecting, reducing, and, if continued, extinguishing them.

Carbon is poured out by the skin, lungs, liver, and kidneys; nitrogen, normally through the kidneys, and sometimes the skin, in the form of ox-

ides; but by all the emunctories, vicariously, when under the stress of pathological states.

In fact, it is this very failure of normal function of any and all the bloods that constitutes disease—pathological condition! Whenever foreign bodies form in, or get into, the bloods of nutrition, secretion, or excretion (in other words, the extravascular), neural, or vascular bloods, to saturation, they produce stasis, and form centres around which accretions gather of like or unlike free elements; poisoning the blood stream by re-solutions of the foreign products, or causing deposits (which become phlegmon, tubercle, cancer, or other soft abnormity, or calculus, or lithic body), as directly, on the downward scale of togetherness, as do the pure blood streams produce every variety of tissue and organ when on the ascending scale of life endowment and organic movement.

That breathing is the type of all motion or function of body is susceptible of the clearest demonstration, whether it be in formation, development, or multiplication. If we wish artificially to produce *tubes*, the typal form of vessel, all we have to do is to add water to a dry amorphous mass of myeline, and we shall see slender tubes shoot from the free margins of the mass in all directions, after the manner of crystallization, proving the identity of *vital* and so-called *chemical* motion.

To produce at will the typical biconcave cell or disk, said to be the specific product of germinal evolution, blood corpuscle, it is only necessary to add serum to the thin-spread attenuated sheet of this same myeline to see these bodies spring up in the field of vision with a spontaneity startling to unbelievers. To be sure they are in general of larger size than the blood disks, but of the exact typical form and appearance.

To enter into all the mutations of these bodies arising in simple myeline and water, myeline and serum, and this same and white of egg, and other viscid substances, in which it produces, under these various enabling circumstances, filaments so very like nerve-tubes as to be undistinguishable from them, also simple cells, nucleated cells, nucleolated cells, cells within cells like pus-cells, and the biconcave cells referred to above, would involve the expenditure of more time, money, brains, and patience, than most of us have at command at this present.

The blood of any body is the life thereof, and holds within its grasp all possibility of function resultant upon every variety and degree of differentiation of organ by which function is elaborated in the interest of the system to which it belongs.

Blood function is evanescent and changeful—much like electric currents, now positive, now negative to the charge already in the bodies upon whose surfaces it makes its devious way.

The function of blood is to act as food, poison, or medicine, according to the state of the localities through which it passes.

In fact, simple heterotypia, error of place of blandest blood, will constitute a poison to the locality in which it is out of normal place.

The excrementitious bloods (urine, bile, etc.) are poisonous when out of their proper receptacles and tracts in the body.

The *cause* of all *action* (motion) is *spirit.* Bodies acted upon are bloods, or products of bloods saturated with spirit, and formed into organs and systems.

Spirit is substance or Presence, whose differentiated fractionalization or debris is matter, whose range is extended throughout ethers, gases, vapors, liquids, colloids (soft solids), and solids.

Blood organization is nothing less than due solution and amorphous elemental admixture of matter, out of which to construct bodies upon the plan or type of parents, or original spontaneity.

Contagions and infections are blood poisons, capable of destroying the life of the whole body into which they enter, or modifying it in various extents and degrees. They are also capable of antidoting other blood poisons already in the system, and thus acting as medicines.

The medium of contagion may be fluid or solid, but that of infection must be gaseous or aeriform; though some viruses are capable of assuming both forms, the variolous virus for instance.

A full discussion then of blood, it is now apparent, involves the whole range of biological movement in normal or abnormal manifestation, evidently including the phases of pronouncement of mind and matter as segregate sequents in substance of FORCE!

NOTES OF OBSERVATION, TO ASCERTAIN THE ULTIMATE DISTRIBUTION OF THE NERVES OF GUSTATION. THEIR ULTIMATE DISTRIBUTION NOT TERMINAL.

BY RUFUS KING BROWNE, M.D.,

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NOTWITHSTANDING it had never been *ascertained* what the exact anatomical character of the extremities of nerve fibres were, it has not been doubted (until recently) that they terminated or ended in the elementary parts of organs and tissues.

Avoiding the voluminous learning and discussion pertaining to the subject, I merely state: first, thirty years ago Doyere reported that he saw the ending of a motor nerve *upon* a muscle in Tardigrada. He asserted that the nerve approached the muscle at right angles, and ended in a conical expansion *upon it.* Second, in 1840 Quatrefages reported seeing the same nerve termination in nematoid worms: and other observers described seeing the same nerve termination. Third, in 1846 Wagner reported seeing a nerve pass through the sarcolemma of a muscle fibril, and terminate amid its contents. Fourth, in 1858 Munke mentioned having seen nerve fibres disappear like stumps broken off. Fifth, in 1860

Kühne, of Berlin, published his preliminary communication,* describing the ending of the nerves by piercing the sarcolemma of transversely striated muscle, and has since, from time to time, described, with some modifications, seeing this termination in the muscle of various animals. Since that time, Rouget, Krause, Cohnheim, and others have given similar descriptions, differing in points of minute detail, but not essentially. Kölliker, in his Croonian Lecture, describes the nerves as lying upon the external surface of the sarcolemma, and *terminating* there.

Kühne still maintains, that the nerve always passes through the sarcolemma, and comes in the closest conjunction with the sarcous elements, or *ends* in matter continuous with the muscles.

It is apparent, from this, that all these observers agree in describing the nerves as terminating either at or in other tissues. That the nerves terminate or end, is therefore held as an anatomical fact, by all observers, with *one* exception.

In 1862 I performed a series of experiments upon the living animal, decisive of certain questions raised by Bernard, which it will be necessary, for the purpose of this paper, briefly to relate.†

Bernard had ascertained that each of the salivary glands is stimulated to functional activity by a particular nerve. The parotid by a small branch of the facial, the submaxillary by the chorda-tympani, and the sublingual by a branch of the latter. He concluded his experiments by remarking, "that a desideratum still exists," for notwithstanding section of the chorda-tympani arrests the secretion of the submaxillary and sublingual glands, and galvanic irritation of the peripheric extremity of the divided nerve at once renews the secretions, "an anastomosis is formed between Jacobson's nerve and the chorda-tympani, above the point on which we are (he is) to divide it, and that to ascertain whether Jacobson's nerve exercises any influence on these secretions, it would be necessary to divide the ninth pair in the immediate vicinity of its cerebral origin—an experiment of such difficulty that no physiologist has hitherto attempted to perform it."‡ This suggestion of Bernard was an anomalous one (since Jacobson's is a *sensitive* nerve), for Bernard had ascertained that to motor nerves only are to be assigned secretory influences. But the point thus raised, if settled, would leave no doubt as to the gross anat-

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* Of the Mode of Termination of the Nerve in Scaled Amphibia, Mammalia, and Man. Translated by Rufus King Browne, M.D. Path. Inst. University of Berlin, 1864.

† Experiments which decide a point raised by M. Claude Bernard, in his recent Demonstration of the Nerves of Salivation. By R. K. Browne, M.D., Prof. of Experimental Physiology and Mic. Anatomy, New York Medical College.—*American Medical Times*, May 11, 1861.

‡ Lectures on Experimental Pathology and Operative Physiology. By M. Claude Bernard. 1860.

omy in the case, leaving his remarkable experiments to ascertain the particular nerves which enact the part of stimuli to the saliva-producing glands, free of any anatomical question; and as Bernard did not perform the operation he suggested, it is certain that he considered it impossible, without killing the animal. In order to comprehend the results of my experiments to attain certainty upon this point, I may briefly state the immediate anatomical relations of the ninth pair.

In the immediate vicinity of its origin, while *within* the cranium, it presents two ganglia. Only a part of its fibres pass through the first, but they all are engaged in the second. Within the inner portion of the foramen, through which the larger division of the nerve leaves the cranial cavity, it parts with the branch known as Jacobson's nerve, which enters the cavity of the tympanum through a minute bony canal, and divides into several branches. These supply the cavity and carotid plexus of the sympathetic and anastomose with some filaments of the facial. This latter is the connection alluded to by Bernard. The division takes place very close to its cerebral origin, and no experiment has been made on the nerve above the level of this division. It is peculiar that it here receives filaments from the upper or jugular ganglion of the pneumogastric. Peculiar because both are *sensitive* nerves.

The other, or larger division of the nerve, after having been joined by filaments of the facial, descends to the mucous membrane of the pharynx and posterior third of the tongue. To these filaments of the facial its motor function is due.

After several unsuccessful experiments, this operation was performed upon a medium-sized dog. It consisted in carefully partly drilling and partly excavating through the posterior portion of the occipital bone, and passing inward and downward a suitable instrument between the dura mater of the lateral border of the cerebellum, and the corresponding portion of the interior of the skull to the situation of the nerve.

When the nerves on either side were divided at this point, the effects upon the animal functions were observed to be:

1st. No impairment of the power of deglutition, either in eating or drinking. Lapping of fluid was performed as usual.

2d. The common sensibility of the posterior two-thirds of the posterior third of the tongue was lost, and with it the sensibility to taste of this part. Taste was intact in the anterior two-thirds.

3d. The ducts of the submaxillary and sublingual glands having been exposed, in the manner described by Bernard, the function of these glands was found to be perfect. The application of an acid always produced a flow of saliva from these glands, through the tubes inserted in the ducts.

By these experiments it was ascertained that the ninth pair exerts no direct influence on the secretory function of the submaxillary and sublin-

gual glands, and that the filaments derived from that branch of the facial known as the chorda-tympani, alone exert the nerve influence, on which the secretory function of the sublingual and submaxillary glands depends.

Further, since after their section the functions of deglutition will be performed perfectly well, the impression which leads to this action is due to the gustative branch of the fifth pair, and not to the glosso-pharyngei, as has been invariably alleged. Lastly, that while section of the glosso-pharyngei at the point of their origin destroys the sensibility of the parts they supply (involving a loss of the power of taste there), the motor power of these parts remains undisturbed. The motor power, therefore, attributed to the pharyngei, must be derived wholly from the fibres of communication received by it from the facial and spinal accessory.

Since the foregoing experiments, I have constantly wished to ascertain precisely the character of the termination or mode of arrangement of the nerve apparatus of the organs of taste. Here, if anywhere, it was evident that if the sense of taste was wholly due to the nervous tissue, the peripheral or extreme arrangement of the nerve fibres would be of marked prominence over the other anatomical elements. But in many attempts to demonstrate the arrangement, I found that it was exceedingly difficult to secure a preparation of the papillæ of the adult or even fœtal tongue, which presented an unmistakable exhibit of the ultimate elements. I had, in several preparations, from time to time succeeded in tracing what appeared to be a commissural relation of nerves between the different papillæ, but was unable to discern whether the nerve fibre or trunk ended at or beneath the summit of the papillæ, or having reached that point turned upon itself and returned to the base, and proceeded to that of other papillæ, thus actually forming a common or commissural relation. I particularly observed, just beneath the submucous tissue, numbers of small oval nuclear masses, having in part a linear and in part an angular or cumulate adjustment. And I could occasionally observe fine apparently compound filaments which seemed to connect these masses, forming a continuation of their substance one with the other.

In 1861, Beale described having demonstrated in many situations in the tissues of mankind and inferior animals, particularly those of the frog, the continuation of fine, compound, pale, and granular nerve fibres, formed in great part of minute, irregularly oval nuclei, at regular intervals, far beyond the point where nerves had been described as terminating or being lost, by other observers. These he represented to be the division and unbroken extension or continuation of dark-bordered fibres, from which he had followed them. Although Wagner had described the branching of dark-bordered fibres prior to this, these fibres described had never been observed. They were *similar* to the "pale" fibres of Remak. These nerve fibres were described as extremely fine, and requiring very high powers for their demonstration. Beale reported *bundles*

of very fine fibres running parallel with many of the small arteries, which were seen to divide and subdivide into still finer *bundles*, which at length form a plexiform network.* Here and there was seen a plexus of very fine fibres, from which *bundles* of fine fibres *diverged* in different directions; and although some of these belonged to and extended continuously from the numerous ganglion cells formed in connection with the nerve trunks, yet many were found by him to result from the division and subdivision of dark-bordered fibres. These fibres were represented as spreading out in the form of a network, every fibre of which he described as being still *compound*. This plexiform arrangement of networks is very general, and can be demonstrated, under low magnifying powers, in the diaphragm of the white mouse, the bladder of the frog, and the eyelid of *hyla-arborea*, if properly prepared.

Beale described the character of a nerve as losing its dark-bordered appearance, and breaking into a finer compound fibre, which appears pale and granular, and connected with it at varying *intervals are oval nuclei*. In the frog these fine nerve fibres are often less than the $\frac{1}{60000}$ of an inch in diameter, yet they are compound, and consist of bundles of still finer fibres. Even these very fine compound fibres still continue to divide and subdivide, and assist to form plexuses and compound plexiform networks. They are directly continuous with the dark-bordered fibres. Sometimes the dark-bordered fibre divides into a *finer* dark-bordered fibre, *and* a bundle of these very fine compound plexuses forming pale fibres. These demonstrations of the ultimate distribution of nerve fibres rendered it plain that other observers had not followed nerve fibres beyond the point where the dark-bordered fibre changes its character and breaks up into a peripheral network. According to Beale, a dark-bordered fibre becomes so fine at the point where it breaks or crosses other similar fibres, that it can only be discerned in preparations made in a peculiar way. These fine fibres have never been delineated by any observer before Beale. They all have represented that each *nerve* fibre passed directly to its terminal distribution to a tissue or organ. They are unanimous in regarding the dark-bordered fibre as passing singly to its destination, sometimes representing it as terminating in a short, fine fibre; in others, describing it as bifurcating so as to form two fibres, which either end upon muscle or gradually are lost in the surrounding tissue. Kühne represents the nerves in muscle as continuous through the sarcolemma with the sarcous tissue. Rouget describes them as dividing into two fine fibres, which terminate in the contractile tissue; while Beale has traced the nerve for a long distance beyond where they make it end, and has seen it divide into very fine fibres, which form an extended, though not *terminal*, net-

* Beale has used powers far higher than any continental observer, namely, $\frac{1}{25}$ and $\frac{1}{50}$, the latter giving, with very good definition, 3000 diameters.

work. He shows that there are no nerve ends, but always plexuses or a network, into the formation of which *many* fibres from different nerve trunks and dark-bordered fibres, enter. From all his observations, he concludes that the peripheral portion of the nerves, always in every tissue and in special organs, does not terminate, but consists of excessively fine fibres continuing from dark-bordered fibres, arranged as a plexiform network. And that the fibres resulting from the division of a single dark-bordered nerve fibre take very different directions, and often leave one trunk to pursue a totally different course with nerve fibres which have come from another part altogether; that many parts of an extensive district of tissue may receive fine nerves from one trunk, while the nerve fibres supplied to distant parts may result from the subdivision of one and the same dark-bordered fibre. For the most part, according to Beale, the main fibres divide dichotomously; but frequently a fibre is seen to divide at one point into as many as three or four divisions, and five, six, or even more, dark-bordered fibres have been seen to spring from one. Traced further, they are found to lose their dark-borderd character and to appear pale and granular, and finally to ramify in compound networks. It is especially to be noted that though the dark-bordered fibres had been seen to divide, yet the numerous subdivisions which Beale demonstrated in all the dark-bordered fibres, near their ultimate distribution, and the great number of fibres into which a dark-bordered fibre may divide in a comparatively short course, had not been observed nor suspected. And this, almost certainly, in consequence of the fibres being exceedingly thin at the points of division, which occur, for the most part, just where a bundle of fibres divides into two branches; and also sometimes where a bundle of comparatively wide dark-bordered fibres passes through a small aperture, as, for example, in a bone, the fibres appear, as it were, drawn out to exceedingly thin threads, from the abrupt diminution of the size of the medullary sheath, sometimes to the $\frac{1}{50000}$ of an inch. Beyond this they can, therefore, be demonstrated only in very carefully and peculiarly prepared specimens. Beside this, in the same nerve trunk were both fine and coarse dark-bordered fibres, with fine pale and granular fibres, the fine fibre running in the same transparent matrix (or medullary sheath) with the dark-bordered fibre. Neither this fine accompanying fibre, nor indeed the finest part of the dark-bordered fibre, can be seen in specimens examined in aqueous fluids, and the former is often obscured by the dark-bordered fibre which accompanies it.

From all these observations, Beale finds that these fine ramifying fibres have escaped the attention of other observers; that they are extremely delicate, and can only be seen by special methods of preparation; that however fine, they are still compound. Next, the finest branches of nerve fibres, which can be seen, are less than the $\frac{1}{100000}$ of an inch in diameter. In mammalia these fibres appear as narrow, long, slightly granular bands,

with oval or nuclear masses of matter situated at short but varying intervals. These oval nuclei, or masses of germinal matter, are *continuous with the tissue of the fibre.* Rarely, they are semi-oval, and placed somewhat on one side of the fibre, so that some of the fibres of the compound fibre pass on one side of the masses of germinal matter without being continuous with them. The length of the nerve fibre between these nuclei differs in different nerve tissue. The nuclei are most numerous in highly sensitive nerve organs, and strikingly so in the tongue of mammalia. Although these have been regarded as connective-tissue corpuscles, Beale has demonstrated, in many situations, that they are directly continuous with undoubted dark-bordered nerve fibres, and that the fine fibre can be easily demonstrated with high powers to be a mere extension between them of the very substance of these nuclei or corpuscles (see Fig. 4), which are a portion of the fibre, sometimes more and sometimes less in a given length or distance. The filamentous portion of the whole being a more *united* elongation of the soft solid matter of the "nuclei." The whole is a pale, granular, *nucleated* nerve fibre, first demonstrated by Beale in the muscular tissue of the mouse. These nuclei have been regarded as connective-tissue corpuscles, beneath and among which they lie, and the whole granular, nucleated fibre as connective tissue. They are, however, ultimate nerve fibres, narrow, slightly granular, and scarcely visible, the entire substance of which consists of *irregularly* alternate nuclear and filamentous portions; the former at short but varying intervals, and in varying number, but one and the same in substance, with the latter uniting them. In the breast muscle of the frog, it has been demonstrated that the dark-bordered fibre branches into a number of exceedingly delicate, fine nerve fibres, the nuclei of which are very close, so that a large number exist in a very limited space (the segment of such a nucleated fibre is seen in Fig. 4). Kölliker has described and figured these numerous oval "nuclei," forming a large part of the so-called "nerve tufts" in that situation. They were represented by him as diffused throughout the swelling ("nerve tuft"), *but as not* being connected with one another, or with any definite structure. But, by special modes of preparation, it has been demonstrated that these nuclei take part in the formation of the fine undoubted nerve fibre in this situation. Here a great defect of observation on the part of those who deny that these nuclei belong to the nerve fibre, is demonstrated.*

In 1862, Lockhart Clarke demonstrated that the nerve fibres constituting the roots of the nerve divide, soon after their entrance into the spinal cord, into bundles, which pursue several different directions—some

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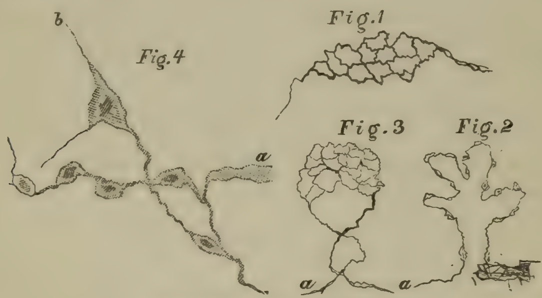
* This deficiency will be found to exist in all cases where there is a radical difference in the accounts of observations by continental observers, and the actual results of those who use better modes of preparation and instruments of far higher power. It fully explains the difference.

passing upward toward the brain, others downward, or toward the lower segments of the cord, and some to the opposite side.

The nerves distributed to a tissue or organ are generally represented as if they all pass direct to their terminal distribution; but according to the foregoing statements of the facts ascertained, the arrangement and course of the nerve bundles, shown by Clarke, in the spinal cord, are precisely similar to the arrangement and course of the distribution of the finer or ultimate nerve fibres distributed to every situation in the body. This is especially apparent in the examination of the "oval coil" (nerve tuft) in the breast muscle of the frog. This consists partly of broad dark-bordered fibres, and partly of fine fibres, formed by the branching, spreading out, and close contorting of the fibres which enter into the formation of the tuft, but it can be demonstrated that from various parts of the oval coil, branches pass off and run on the surface of the sarcolemma, passing to other bundles. They therefore establish a commissural relation with other nerve fibres and bundles. In all the situations we have named, undoubted nerve fibres may be demonstrated going from a trunk passing at right angles to it, and passing into or forming other trunks, thus establishing a commissural relation, as respects other ultimate or peripheral distribution of nerves. And whenever numerous terminal organs exist, these are always connected together by nerve fibres, which pass from one to the other. This is the case in the papillæ of the tongue and other organs of sense.



EXPLANATION OF PLATE.

FIG. 1. Formation of network or plexus of finest nerve fibres.

FIGS. 2 and 3. Arrangement of pale nucleated fibres in papillæ on tongue. *a*, *a*, shows the commissural relation of entering and emerging nerve fibres.

FIG. 4. Dark-bordered nerve fibre, *a*, and its division into closely nucleated fine fibres. The masses of germinal matter are well seen. Bladder of frog x 750. The close approximation during growth of many concentrated in a small space, presents the "knotted" appearance in "nerve tufts," "and organs" (Kühne). *b*, finest nerve fibres.

In the fungiform papillæ of the tongue of the *hyla-arborea*, or little green tree-frog, Beale has ascertained a fine plexus of nerve fibres, with numerous oval nuclei. A dark-bordered fibre rises in the axis of the papillæ, and can be traced directly into this plexus formed of its branches. From its upper part, finer fibres, consisting almost entirely of the nuclei,

interlace with one another in the most intricate manner, forming a layer which appears perfectly granular, except under very high powers ($\frac{1}{50}$). These connect by identity of substance with the hemispheroidal mass of *epithelium-like* cells, which surmount the surface of the papillæ. From the bundles of nerves in the papillæ of the tongue of the *hyla* fine nerve fibres can be traced directly into this hemispheroidal mass. The masses of nuclei are so numerous, and crowded, and compressed within so small a space, that it is extremely difficult to trace unmistakably their ultimate arrangement. In some simple papillæ of the mucous membrane mere loops are seen. In some these loops are compound and connected, so as to form complex networks. (Figs. 1 and 3.) In all cases there are entering and emerging large fibres, proceeding in diverse directions to and from adjacent papillæ. These observations demonstrate several important points in the physiology of the various characters of sensation, and especially of special sense. They have identified a large proportion of tissue as true nerve tissue, which has hitherto attracted no special notice, and has been regarded as connective tissue. They demonstrate that no part of the sensitive structure of mammalian animals forms organs of special sense by a *terminal* arrangement. They show that the nervous tissue is an undivided continuation from centre to periphery and back. And finally, they force upon us the conclusion, adverse to all our present theories of sensation, that neither sensation nor motion are physiological phenomena, beginning at a nerve terminus on the one hand, and ending at a nerve terminus on the other.

We append the titles of some of the most important communications which have appeared on the questions involved:

Kühne. Of the mode of termination of the nerve in *scaled amphibia, mammalia, and man. Preliminary communication*, translated from Centreblatt für die Medisinischen Wissenschaften. By Dr. R. K. Browne. Berlin, 1864.

Kühne. Ueber die peripherischen der motorischen Nerven. Leipzig, 1862.

Kühne. Note sur un nouvel organe des système nerveux. Compte Rendus, Feb. 1861.

Theodore Margó. Ueber die Endigung der nerven in der quergestreiften Muskelsubstanz. Pest, 1862.

Kölliker. Untersuchungen über die letzten Endigungen der Nerven. 1862.

Rouget. Note sur la terminaison des nerfs moteurs dans les muscles chez les reptiles, des oiseaux et les mammifères. Compte Rendus, Sept. 20, 1862; also Brown-Séquard's Journal, 1862.

Naunyn. Ueber die angeblichen peripherischen Endorgane der motorischen Nervenfaserm. In Reichart und Du Bois Reymond's Archiv., 1862, p. 481.

L. Beale. Further observations on the distribution of nerves, to the elementary fibres of striped muscle. Phil. Trans., June, 1862.

Krause. Ueber die Endigung der Muskelnerven. Henle und Pfeufer's Zeitschrift, 1863, p. 136.

L. Beale. On the anatomy of nerve fibres and cells, and on the ultimate distribution of nerve fibres. Quarterly Journ. of Mic. Science, April, 1863.

L. Beale. Further observations in favor of the view that Nerve-fibres never end in voluntary muscle. Proc. of the Royal Soc., June 5, 1863.

L. Beale. Remarks on the recent observations of Kühne and Kölliker, upon the termination of the nerves in voluntary muscle. Archives of Medicine, vol. iii. p. 25.

Th. Wilhelm Englemann. Untersuchungen über den Zusammenhang von Nerve and Musklefaser. Leipzig, 1863.

Kühne. Ueber die Endigung der Nerven in den Muskeln. Virchow's Archiv., Band 29.

Kühne. Der Zusammenhang von Nerve und Musklefaser. Virchow's Archiv., Band 29.

L. Beale. An anatomical controversy. The distribution of nerves to Voluntary Muscle. Archives of Medicine, vol. iv., 1865.

L. Beale. On the Structure and Formation of the Sarcolemma of striped muscle, and the exact relation of the nerves, vessels, and air-tubes (in the case of insects) to the contractile tissue of Muscle. Trans. Mic. Soc., 1864.

Rouget. Sur la terminaison des nerfs moteurs chez les Crastaces et les Insectes. Compte Rendus, Nov. 21, 1864.

Kühne. Untersuchungen über bewegungen und veränderungen der contractilen substanzen. Reichart und Du Bois Reymond's Archiv., 1860.

Kölliker. Croonian lecture. Proc. Royal Soc., 1862, p. 78.

L. Beale. Branching of nerve trunks. Archiv. Med., vol. iv. p. 78.

Kühne. Various papers. Virchow's Archiv., 1864–66.

Ciaccia. On the nerves of the cornea, etc. Trans. Mic. Soc., July, 1863.

L. Beale. On the ultimate nerve fibres, distributed to muscles and some other tissues.

"On very fine Nerve-fibres in Fibrous Tissues, and on Trunks composed of very fine Fibres alone." L. Beale. Archiv. of Medicine, vol. iv.

On the Structure of the so-called Apolar, Unipolar, and Bipolar Nerve-cells. Phil. Trans., 1863.

L. Beale. On the Nerve-fibres distributed to the Papillæ of the Frog's Tongue, Royal Society, June, 1864; and on the Structure of Papillæ of the Frog's Tongue.

L. Beale. On the fine Nerve-fibre accompanying the dark-bordered Fibre. Archives of Medicine and Philosophical Transactions, 1860 and 1862.

L. Beale. On the Apolar, Unipolar, and Bipolar Nerve-cells, etc. Phil. Trans., 1863.

L. Beale. Indications of the Paths taken by the Nerve-Currents, etc. Proceedings of the Royal Society, vol. xiii. p. 316.

L. Beale. How to Work with the Microscope. Third edition, p. 204.

L. Beale. On the Branching of Nerve-trunks, etc. Archives of Medicine, vol. iv. p. 127.

On the Minute Structure of the Gray Matter of the Convolution of the Brain of Man, the Sheep, Cat, and Dog. By L. J. Beale. Proceedings Royal Society, June 18, 1863.

Researches on the Sympathetic Cord. By L. G. Courvisier. Archiv. für Mikroskopische Anatomie.

H. Hayer. On the Extension of Nerve-fibres into the Epithelium of the Horn-skin. Muller's Archiv., May, 1866.

Fritz Muller. On the Common Nervous System (Kolonial-Nerven System) of the Bryozoa (Polyzoa), exemplified in Serialaria, Continhuii. Hiegmann's Archiv., 1860, p. 311.

L. Beale. New Observations upon the Structure and Formation of certain Nervous Centres. London and Leipzig, 1864.

REMOVING TARTAR.

BY W. W. BROCKWAY, ALBANY, NEW YORK.

In the last volume of the Transactions of the New York State Medical Society—in an article headed The Gingival Margin as a Diagnostic Sign, by Lawrence McKay, M D., Rochester, N. Y.—a charge of so much ignorance and malpractice upon the part of the dental profession is made that I am not willing to have it go unanswered.

I quote from his article. "This margin shows different appearances in different cases; in some it is a mere red line along the edges of the teeth; in others, it appears red and congested fully one-eighth of an inch, and even the whole depth of the gums; again, it appears red and spongy, and secretes a pus-like fluid; in other cases the gums appear spongy, and chiseled away from the edges of the teeth, showing their roots in a carious and filthy condition.

"Dentists are in the habit of attributing all those changes to the accumulation of tartar round the roots and along the edges of the teeth, which they dig and scrape off, to the great injury of their patients."

The last sentence is the only one with which I have to deal.

Dentists find that where tartar is allowed to accumulate around the teeth, that the gum is gradually forced away from them, the periosteum is destroyed, and the alveolar process gradually absorbed, and the teeth finally become so loose that they are useless. To prevent this loss of the

teeth, we, in the first place, remove the tartar, and then, by such other local or constitutional treatment as the case may require, restore the gums and teeth to a healthy condition.

But, as I have only to look for injury caused by the removal of tartar, I have no remedies to discuss. In thirty years of practice as a dentist, I have never found a case where the removal of tartar proved an injury to the patient; but in hundreds of cases, have, by removal of tartar, and by proper application of the brush afterward, so changed the appearance of the gingival margin as would have convinced the learned doctor that the removal of tartar did not always prove injurious to the dentist's patients.

I hope, for the sake of Dr. McKay's patients, that he may not prove as ignorant of his own profession as he is of the value of dental practice; for, if he is, he may feel truly thankful that the grave may conceal many errors of practice.

EXPLOSION OF A TOOTH.

BY AN INQUIRER.

Dr. A., a gentleman some forty years of age, and a physician in very good standing, called on me a few days since to have a tooth filled. Upon examining his teeth, I noticed upon the external surface of the left upper central incisor a very fine line near the centre of the tooth, and running parallel with its cutting surface, plainly indicating a fracture in the enamel, if not deeper. After carefully examining the tooth, I found it perfectly healthy and sound in every respect. I called the attention of the doctor to the circumstance, and asked if he could explain it to me. In reply to my question he made the following statement, which I give in his own words: "When I was about twenty years of age I suffered most intense pain with that tooth, the pain coming on quite suddenly one night at supper. It being a very cold night, I endured my agony until the next morning, when I mounted my horse and started for a physician, intending to have it extracted. I had gone but a short distance, when the pain, which seemed to be increasing every moment, stopped as suddenly as it began. In a few minutes after, I called at a neighbor's house for some water, and in place of the water took a piece of ice into my mouth, and as soon as it came in contact with this tooth it *exploded, making a noise equal to the bursting of a shell!* I really thought that the top of my head was blown off! There was no pain, not the slightest uneasiness in the parts at the time, nor has there ever been since." Such is the statement of my friend, and I leave it with you without any comment, only adding, a more reliable gentleman does not live in this country.

MICROSCOPY OF THE TEETH.

BY S. P. CUTLER, M.D., D.D.S., HOLLY SPRINGS, MISSISSIPPI.

(Continued from page 405.)

THE cementum or crusta petrosa constitutes the covering of the dentine of the fang terminating at the enamel in the neck.

This body is extensively occupied at the apex of the fang and a short distance up with lacunæ and canaliculi, being more numerous at the apex than farther up.

These lacunæ and canaliculi are homologous to those of the bones, there being no essential difference, their functions being no doubt similar. Some of the lacunæ are about the size of a blood disk, and the canaliculi corresponding in size to the terminal tubuli, with which they no doubt anastomose also with each other. These cavities have been well represented in a drawing in the DENTAL COSMOS. These caverns cannot be regarded as Haversians, as no globulin could enter them.

In ascending the fang, after passing the middle region, the lacunæ and canaliculi entirely disappear or change their distinctive form; in their stead there are discoverable elongated caverns running transversely to the fang immediately in contact with the dentine, stopping before reaching the centre of the cementum, some, however, extending farther outward than others, being in contact at the inner surface of the cementum, but more or less isolated farther out or at their terminus.

At the neck, between these caverns and the dentine, there is an areola, clear, distinct, smooth, and regular.

From these caverns to the surface of the cementum, there is nothing discoverable, only minute tubuli or canaliculi, and the contour lines or rings, the latter discoverable in some specimens in the neck only.

I shall speak of the functions of these canals under another head.

The enamel has been sufficiently well described and represented in drawings without any special description by myself being necessary. The radiated beadlike structure, radiating out from the dentine to the surface, has no resemblance to the dentinal structure, being larger in diameter, interrupted by partitions, resembling the cell structure in this respect. They are not hollow or open, but solid dense rock containing but a small per cent. of animal substance, only one part in 21; this proportion changing with age.

The functions of this body are principally mechanical, serving as a protecting medium to the more delicate parts beneath. This body possesses but little if any vitality, and that only on the inner surface where the tubuli terminate.

It will be readily admitted, from what has been said, that the dental organs are the most wonderful and complex of the organism, not except-

ing those of vision and sound, if possible, though wonder and astonishment beset our path as we investigate the animal organism from beginning to end, and the further and more minute the investigation, the greater is our wonder and astonishment, and, I might almost say, ignorance.

The question might be asked easier than answered, why are the dental organs the most complex and varied in structure, when their chief office in the economy is principally mechanical, and ornamental, and articulatory?

To return to the tubuli. I suppose the terminal branches in a large molar tooth would number, from an imperfect calculation, one hundred thousand, more or less so, that when the dentist lifts his excavator and plunges it down into a decayed tooth, he is not only playing on a harp of a thousand strings, but that of ten or a hundred thousand—that, too, without the just man being made perfect. No wonder, then, that the sensitive and delicate female, whose teeth are exceedingly quick and tender, writhes and cringes under the dissecting dental scalpel. No wonder tears roll down the cheeks at every stroke of the instrument when hundreds of nerve filaments are severed at every stroke, piercing like sharp daggers to the brain, and from thence to the whole nervous system, vibrating like lightning shocks through those delicate nerves inclosed in solid ivory canals.

It will be inferred, from what has already been said, that I believe the tubuli are occupied by nerves; so I do, and shall attempt to convince others of the fact before I am done.

The hollow or nerve cavity of a tooth is lined with a thin membrane adherent to the dentine; this membrane entering the tubuli forms linings for them throughout their whole extent (a priori).

The pulp proper is also covered by a separate and distinct membrane, with openings for each tubuli where the nerve filament passes out from the main pulp to enter the tube. Whether or not this membrane sends off a covering for the nerve filaments, I am as yet unable to determine for a certainty.

In this respect, the interior of a tooth somewhat resembles the interior of the cranium.

When the pulp membrane is examined under high powers, the openings corresponding to the tubuli may be distinctly seen, though not apparently quite so large as the tubuli, owing, perhaps, to the contractility of this membrane after detachment.

The membrane lining and adherent to the hollow of the tooth, when detached and examined, shows the openings corresponding to the tubuli also. These membranes might, with propriety, be denominated dura and pia mater dentalis.

That the nerve pulp sends off filaments that enter each tube is still

further proven by the fact, that to extract a pulp from a tooth these filaments have to be broken loose by the action of the broach that is introduced for that purpose, and this process is not very easily accomplished even after the death of the pulp.

This pulp cannot have any other attachment to the interior or pulp cavity than from these minute branches passing into the tubes.

If there was wanting any further proof, the sensibility of the dentine when in a state of decay would be sufficient to my mind.

When a nerve is extracted, these filaments are not withdrawn from their places in the dentine, but broken off at the inner wall of the nerve cavity, leaving the filaments in the canals, which afterward disappear, leaving the dentine open, porous, and absorbent, capable of taking up fluids by endosmose, and frequently undergo, from that cause, discoloration, if not filled so as to exclude all fluids.

How these nerve filaments are derived from the pulp I cannot say; so it is, they all meet and form, or constitute the pulp which terminates in an insignificant branch or nerve where it passes out at the apex of the fang. In this respect the dental pulp is unlike any other nerve, and has no homologue in the economy. After leaving the apex of the fang, passing up this small nerve sends off nerve filaments to each tubuli every five-thousandth of an inch on all sides of the nerve cavity and throughout the entire extent of this cavity.

This is proven by the fact that, as the nerve cavity ossifies from natural wear of the crown down, this same order obtains, varying only in their regularity, they being, as before stated, more irregular in their course down into the pulp.

(To be continued.)

FACTS FOR THE PROFESSION.

BY D. P. GREGG, D.D.S., COLUMBIA, S. C.

1st. There is no necessity for lancing the gums previous to extraction, whatever may have been taught in the books or out of them, except where the crown has been broken off low down, and the gum has so closed over the fangs that it absolutely overlaps them.

2d. There is no more danger of tearing the gum if you do not "*lance thoroughly*" than if you did, however seriously and conscientiously any man may affirm there is.

3d. There is a great deal less pain inflicted in the operation, less hæmorrhage, and it takes a great deal less time.

4th. These facts I affirm, after a full practice and ample tests for a period of eight or ten years. If you do not believe *me*, just try it—try for yourselves. I commend these facts to the members of the profession everywhere.

IMMEDIATE INSERTION OF TEMPORARY TEETH.

BY. J. E. SCHRŒDER, RED BANK, NEW JERSEY.

To insert temporary teeth immediately after the extraction of the natural organs, in my opinion, is objectionable, especially when the gums are diseased. In the first place, taking the impressions of the lacerated gums is a barbarous practice; second, the pressure of the plate upon the sore and lacerated gums proves a continual source of pain.

After the extraction of the teeth, if the gums are much diseased, my plan is to apply astringents freely, and in five or six weeks, when the gums have been somewhat absorbed and assumed a healthy condition, the impression may be taken without pain, and the operation inserted with advantage to the patient and credit to the operator.

PROCEEDINGS OF DENTAL SOCIETIES.

PROCEEDINGS OF THE ODONTOGRAPHIC SOCIETY OF PENNSYLVANIA.

BY THOS. C. STELLWAGEN, D.D.S., A.M.

THE fourth annual meeting of the Odontographic Society was held, Monday, May 6th, 1867, in the Philadelphia Dental College, Dr. Wm. C. Head in the chair.

The minutes of the previous annual meeting were read and adopted.

The reports of the officers were read and accepted.

M. Lukens Long, D.D.S., and Wm. A. Holton, M.D., were unanimously elected active members, and L. D. Shepard, D.D.S., of Salem, Mass., a corresponding member.

On motion of Geo. W. Ellis, D.D.S., the following resolution was adopted:

Resolved, That while this Society regards the regulations and by-laws adopted by the Association of the Colleges of Dentistry, March 20th, 1867,* as a step in the right direction, it earnestly desires to see all practice qualifications abolished, and two full courses of lectures, followed by a satisfactory examination, as the only means of procuring the degree of D.D.S., excepting, however, the cases noted in the resolution, where they regret to observe an absence of that positive opposition which the practice of conferring degrees upon those not attending lectures justly merits both on the part of the profession and the community.

On motion of Prof. McQuillen, the following resolutions were unanimously adopted:

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* Reported on pages 540–541 DENTAL COSMOS for May, 1867.

Resolved, That the members of this Society having carefully considered the Code of Ethics adopted by the American Dental Association at the last annual meeting, respectfully decline to accept the same.

Resolved, That while pleased to receive *suggestions* from the American Dental Association, the members of this Society do not recognize in the constitution of the Association the right of that body to dictate terms to the local societies, either with respect to theory, practice, or ethics, or to deny the right of representation to societies which may decline to adopt what has been agreed upon in such directions by that organization.

The Society then went into the election of officers for the ensuing year to May, 1868, resulting as follows:

President.—Wm. C. Head, D.D.S.

Vice-Presidents.—Geo. F. Platt, D.D.S., M. Lukens Long, D.D.S.

Corresponding Secretary.—J. H. McQuillen, D.D.S.

Recording Secretary.—Thos. C. Stellwagen, D.D.S.

Librarian.—Wm. A. Breen, D.D.S.

Treasurer.—Wm. P. Henry, D.D.S.

Executive Committee.—Geo. W. Ellis, D.D.S., W. H. Trueman, D.D.S., Wm. A. Holton, M.D.

Delegates to American Dental Association, Drs. Thos. C. Stellwagen, Wm. C. Head, M. Lukens Long, Wm. P. Henry, Geo. F. Platt, Wm. A. Breen, Saml. J. Dickey.

A number of gentlemen were appointed essayists for the year.

Dr. Ellis presented for the consideration of the Society a new form of gold for filling teeth, known as "Plastic Gold."

From considerable experience in its manipulation, and the indorsement of its working qualities by many, if not the most of our best operators in Philadelphia, he felt warranted in *urging* rather than simply *submitting* it, believing that the many desirable features justly claimed for it would render the performance of dental operations *easier*, and insure the production of results uniformly better than heretofore obtained.

REPORT OF THE DISCUSSIONS OF THE SOCIETY OF DENTAL SURGEONS OF THE CITY OF NEW YORK.

BY J. S. LATIMER, D.D.S.

At the meeting, held January 2d, 1867, Dr. Atkinson recommended the appointment of standing committees on the different branches of science and art pertaining to dentistry.

On motion, a committee was appointed to consider the suggestion, of which Dr. Francis was made chairman.

On motion, it was decided to have the Society incorporated, and a committee was appointed to apply for a charter.

Dr. C. E. Francis then read the following on

MATERIALS FOR FILLING TEETH.

The operation of plugging carious teeth is one of the most important duties within the sphere of a dentist's practice, requiring a degree of nice manipulative skill, guided by the presence of sound judgment and a thorough knowledge of the physiological and pathological conditions of the structures upon which the operation is to be performed. If every operator upon human teeth was fully competent to faithfully perform the duties assumed by practitioners of the dental art, the world would indeed be blessed by the result of their united labors. Unfortunately for the profession and for those who seek its benefits, such is not the case. Of course, there are many who are thorough and proficient, and their operations can be pronounced almost or quite perfect; but it will not be denied that many are yet very much in the background, and their operations at times present a sorry exhibition of dental skill. Indeed, very few among us have not, during our professional career, done more or less plodding in the dark; but since the inauguration of dental societies, a new impetus seems to have taken possession of the members of our profession, and better things are expected from them.

It requires some degree of judgment to enable us to decide just *how* a cavity should be prepared for plugging, just *when* to plug, and what *sort* of material will best preserve each individual tooth under the varied conditions or circumstances, such as may occur; and to acquire the ability for this judgment, should be our earnest endeavor.

The art of "odontoplerosis," or filling cavities in decayed teeth, has, to some extent, been practiced (so the books say) about three hundred years. Preparations of wax, combined with the various resinous gums, were first used for this purpose. It has been asserted that the ancient inhabitants of oriental climes had some knowledge of this specialty of dental science, and were in the habit of filling carious teeth with some white substance, much in appearance like the oxychloride of zinc of our day. This is classed among the "lost arts," I believe.

The first among the metals employed for tooth plugs were lead and tin. Tin foil was extensively used for many years, and, when properly introduced, answered a very excellent purpose; in many cases preserving the teeth for a very long period of time. This material is not extensively used at the present time, yet, in some respects, it is one of the best substitutes for gold ever used. Its dull color, easily disturbed surface, and liability to oxidize, are the principal objections to its common use. By many dentists it is chiefly employed for plugging deciduous teeth, and oftentimes for the dentes sapientias, and for buccal surfaces of the first and second molars. Its use is attended with various grades of success, depending usually upon the manner in which it is packed. In some few

mouths tin foil will retain its color perfectly, but in others it will become very much discolored. Tin foil, being non-adhesive, must be consolidated by the wedging process. As it requires nearly the same amount of time and labor to prepare and fill a cavity with tin as with gold foil, it can hardly be said there is any economy in its use. We may, therefore, assume that the day for tin stoppings has nearly passed. For filling deciduous teeth, especially for very young children, the best result may, I think, be attained by the use of a plastic material, such as Bevin's or Hill's stoppings. Fillings of this kind can be quickly introduced and packed, and the danger from moisture avoided. I have, on several occasions, recommended this kind of filling for temporary use, believing it to be invaluable, if not almost indispensable, to the dentist who looks for the best results from his operations. Teeth carefully prepared and filled with this stopping, if properly watched and occasionally repaired, or refilled anew, may be kept for many years. I would not recommend it as a permanent stopping for adult teeth much exposed to attrition during the process of mastication ; but for soft, low-toned wisdom teeth, decayed on their posterior or buccal surfaces, I deem it a safe filling, and better calculated to preserve the tooth structure than any other material ever yet used. When the sixth-year molars commence to decay, as is frequently the case, almost as soon as they appear, unless the little patient be remarkably *patient*, for a child, and the flow of saliva can be controlled, I usually introduce fillings of this description, with the admonition to have such teeth examined at stated intervals, until they become better calcified, and the patient old enough to endure the operation of having them thoroughly plugged with gold. I would, however, caution those who have had but little experience with any description of gutta-percha stoppings, to avoid packing it into large cavities where the walls are thin and frail, lest the expansive properties it possesses burst such walls asunder.

For real permanent plugs, the best material, in the great majority of cases, is pure gold. This is in the form of foil, both adhesive and soft or non-adhesive, crystals, sponge, or shredded gold. The non-adhesive was first employed for plugging teeth, and was introduced in the form of coils or ropes, pellets and cylinders, by the wedging process. Even to this day it is extensively used, but its use is gradually supplanted by the several forms of adhesive gold, all of which are consolidated by what is termed the welding process. Probably among these the foil is generally preferred. It should be quite thin, numbers 2 and 3 being most easily manipulated. It is usually rolled in ropes and cut in small pieces. Some of our best operators prefer the crystal gold, which they convert into most excellent plugs ; others prefer the shredded gold, which also seems to answer an admirable purpose. The preference for each depends much upon the acquired habit of manipulation. All forms of ad-

hesive gold should be consolidated with serrated points, and give the greatest degree of satisfaction when impelled by the gentle influence of the wonderful mallet.

Next to gold, amalgam plugs seem at present to be most extensively in use. These sometimes appear to answer a very good purpose, and have in a great many cases been the means of preserving to years of usefulness teeth that would otherwise have been lost. I do not deem it a safe filling for poorly calcified teeth. The most potent objection to its use is its tendency to recede from the walls of the cavity in which it is placed. Most amalgam plugs discolor badly. The best preparation I have used is made by Dr. Lawrence, of Lowell. I would not advise the use of amalgam where gold can be advantageously employed.

The oxychloride of zinc, or artificial bone filling, as it is generally called, possesses some value, but is oftentimes overrated. It answers a fair purpose for temporary stoppings in frail or sensitive teeth. It has been employed with some degree of success for protecting nearly exposed dental pulps from the pressure consequent upon plugging with gold, also to protect from thermal changes. Indeed, cases have been reported where it has been introduced over pulps actually exposed, with good results. I will simply refer to one other material for filling teeth. It is known as fusible metal. This was, several years ago, placed in market as a substitute for amalgam, and its use was indorsed by many good operators. It has had its trial, and, I think, its day. How many now advocate its use?

G. A. Mills indorsed the paper just read. Had been greatly pleased with Bevin's stopping, which he had known to answer a good purpose for three years or more on grinding surfaces. He nurses chalky teeth, filling and refilling statedly with Bevin's stopping. Does not like Wood's fusible alloy. Mentioned one case, however, in which this alloy gave special satisfaction.

G. H. Perine claimed we should be eclectic, employing for any given case the material and the method which seemed best adapted to the circumstances. He had removed a tin filling which, twenty years before, had been arched over an exposed pulp, and had found the pulp alive. He had not employed Wood's alloy, but had for three or four years worn an experimental plug of it in his own mouth. He sometimes caps exposed pulps with plaster of Paris. He had seen a superior central the labial wall of which had been whitewashed with plaster of Paris before filling with gold, and, though twenty years had elapsed, the color was good and the preservation perfect.

J. S. Latimer had found it necessary to fill temporarily with a gutta-percha or zinc filling, or to interpose one of these substances between the gold and sensitive dentine, to prevent pulps from being inflamed by thermal irritation. He had lately, on the recommendation of our esteemed

member, Dr. W. A. Bronson, employed Bevin's filling and Wood's alloy in the same cavity,—the former being next the walls, and the alloy superadded to prevent the gutta-percha from being removed by attrition.

C. E. Francis was induced to use Wood's alloy by the representations of members of this Society. He had seen teeth softened apparently by the effect of the alloy plugs, and had entirely discarded it for filling teeth. A gentleman from Georgia had lately become a patient of his, in whose mouth he found a number of most excellent fillings. He remarked to the gentleman that he had been blessed with a faithful dentist. He was happy to see that dentist here to-night in the person of Dr. B. B. Alfred, of Lagrange, Georgia.

G. A. Mills had lately removed some strips of platinum from the roots of a tooth. A friend of his had removed a tack from a dental canal.

W. H. Atkinson, M.D., said the fault is more in the operator than in the material he employs when failures ensue. We must have control of the patient, or we can do nothing. Gold is his favorite; but other materials are admissible when we can make them answer a better purpose. He adds twenty-five per cent. of precipitated silver to Lawrence's amalgam to give it the proper hardness. He discarded Wood's alloy many months ago. Crowns could be built up with amalgam by proper manipulation.

C. P. Fitch, M.D., had lately been using gold of Thillon's beating, both foil and "block," and liked them much. He believed the best substance has not yet been discovered. Next to gold, prefers amalgam. Wood's alloy does not withstand the action of the fluids of the mouth, hence is inadmissible. A desideratum is a substance which may be inserted in a plastic state, and which will subsequently acquire the requisite hardness, color, and durability. For capping exposed pulps, he employs gold plate made concave, and lined on the concave side with Bevin's or Hill's stopping.

I. W. Lyon spoke of a plug given him by another dentist, in which amalgam had been placed in contact with gold, and, though the gold had not been amalgamated, the adhesion between it and the amalgam cap was quite strong. Several teeth filled with these compound fillings, the amalgam being used as a cap, became troublesome, and were replaced with gold.

C. E. Latimer, D.D.S., objected to the terms "cement" and "plug" as applied to fillings in teeth. From their significations they could not properly be used to designate amalgam and filling. He believed the term "secondary dentine" also misapplied in the larger number of instances, for the reason that the deposition of dentine continues until the pulp cavity and canals are entirely obliterated. He would not, as one gentleman had suggested, whitewash a frail, labial wall with plaster of Paris to prevent the gold from showing through. For such a purpose

he prefers a film of Hill's or Bevin's stopping, which is much less friable. When pulps are only slightly exposed, and especially if no inflammation has taken place, he caps with Bevin's filling ; but only in the most favorable cases has he much faith in results.

W. H. Atkinson, M.D., said that Corydon Palmer had filled cavities in teeth with gold and tin foils by placing the gold next the walls and filling the balance of the cavity with tin, yet no bad results followed ; with reference to terminology, he agreed with Dr. C. E. Latimer, except in the matter of "secondary dentine," which is deposited on the anterior and posterior walls of the pulp cavities, and has irregular and tortuous tubuli, by which, under the microscope, it is readily distinguished from original or primary dentine. Hence the term is correctly applied. In his experience the approximal surfaces of teeth are less sensitive than the buccal, and this is explained by the fact that the secondary dentine with its irregular tubuli, which do not communicate with the pulp cavity, is interposed between the primary dentine and the pulp.

T. H. Burras deemed Wood's alloy objectionable for filling teeth, on account of its decomposition by the fluids of the mouth, as shown by the yellow deposit of sulphide of cadmium on that and adjoining teeth. Amalgam, as now prepared, answers every purpose as a filling which a fusible alloy could, and is not open to the objection very justly urged against such alloys, that considerable pain is caused by their introduction. He employed only gold and amalgam for permanent fillings.

CHICAGO DENTAL SOCIETY.

At the annual meeting of the Chicago Dental Society, held April 8th, 1867, the following officers were elected :

President, Dr. S. B. Noble ; 1st Vice-President, Dr. J. H. Young ; 2d Vice-President, Dr. A. W. Freeman ; Corresponding and Recording Secretary, Dr. A. E. Brown ; Treasurer, Dr. Wm. Albaugh ; Librarian, Dr. W. A. Stevens ; Executive Committee, Dr. Geo. H. Cushing, Dr. J. Ward Ellis, Dr. Wm. Albaugh.

A. E. Brown, *Secretary.*

HUDSON RIVER ASSOCIATION OF DENTAL SURGEONS.

BY DR. L. S. STRAW, NEWBURG, NEW YORK.

There has long been a desire among the dentists residing on the Hudson River to form a dental society. On the 28th of March a preliminary meeting was held in Poughkeepsie, at the office of Drs. Roberts and Houghton, and a committee appointed to draft a constitution and by-laws for a permanent organization, and issue a call for the 25th of April ; on which day, in answer to the call from the committee, there were

found assembled at the Morgan House, in Poughkeepsie, twenty dentists favorable to, and earnest for the formation of, a dental association. Dr. Charles H. Roberts was called to the chair. The draft of a constitution and by-laws was presented, discussed, amended, and adopted, and twenty signatures appended thereto.

At the evening session, the following officers were elected for the ensuing year:

President, Dr. E. D. Fuller, of Peekskill; Vice-Presidents, Dr. W. A. Palmer, of Poughkeepsie, Dr. Geo. S. Allan, of Newburg; Secretary, Dr. L. S. Straw, of Newburg; Corresponding Secretary, Dr. T. W. Du Bois, of Poughkeepsie; Treasurer, Dr. C. T. Royce, of Middletown.

The regular meetings of the Association are to be three in each year, viz.:

The second Thursdays in May, September, and January.

On motion, Professors J. H. McQuillen and G. T. Barker, of Philadelphia, were unanimously elected honorary members.

On motion, it was resolved that the President be requested to extend to Prof. J. H. McQuillen an invitation to deliver an address before the Association at its next meeting.

A special meeting will take place in Poughkeepsie, on the afternoon and evening of Thursday, June 13th.

OLD COLONY DENTAL ASSOCIATION.

BY L. W. PUFFER, NORTH BRIDGEWATER, MASS.

In accordance with a call issued by the dentists of Southeastern Massachusetts, who were present at the recent session of the American Dental Association in Boston, a convention of dentists was held at Middleboro', on the 15th of August, 1866, to consider the subject of forming an association in this section of the State. Dr. D. S. Dickerman, of Taunton, was chosen President *pro tem.*, and Dr. C. E. Williams, Secretary. Voted to organize a society, to be called the "Old Colony Dental Association." A constitution was adopted, and the following officers were elected: President, D. S. Dickerman, D.D.S., of Taunton; Recording Secretary, George R. Whitney, of North Bridgewater; Corresponding Secretary, Loring W. Puffer, of North Bridgewater; Librarian and Treasurer, Julius Thompson, of Taunton; Executive Committee, N. C. Fowler, C. G. Davis, Julius Thompson, C. E. Williams, L. W. Puffer.

The first meeting of the Association was held at Bridgewater, Sept. 10th. Dr. D. S. Dickerman, of Taunton, read an essay on "Alveolar Abscess." Clinic, by Dr. N. C. Fowler, of Yarmouthport. The second meeting was held at Taunton, Nov. 12th. Clinic by Dr. Thompson, of Taunton. Essay by Dr. C. G. Davis, of New Bedford, on the "Com-

parative Value of Anæsthetics." The third meeting of the Association was held at the Parker House, New Bedford, January 14th, 1867. Clinics by Drs. D. S. Dickerman, of Taunton, and C. G. Davis, of New Bedford. Dr. J. Q. Dickerman, of Taunton, explained Dr. Hurd's method of taking impressions in flat mouths. The fourth meeting was held at Taunton, March 12th, 1867. Dr. Thompson read an essay on the "Extraction of Teeth." A revised constitution, by-laws, and code of ethics was adopted, and a committee appointed to have the same printed. Drs. D. S. Dickerman, of Taunton, C. G. Davis, of New Bedford, and L. W. Puffer, of North Bridgewater, were elected delegates to represent this Association at the next meeting of the American Dental Association.

The fifth meeting was held at North Bridgewater, April 10th. The next quarterly meeting will be held at New Bedford, July 10th. The annual meeting will be held at Taunton, Wednesday, June 12th, and North Bridgewater, Thursday, 13th. There will be a public address on both evenings by Dr. Wm. H. Atkinson, of New York. Other distinguished members of the profession will be present. The profession are invited.

MERRIMACK VALLEY DENTAL ASSOCIATION.

BY G. A. GERRY, LOWELL, MASS.

THE semi-annual meeting of this Association was held in Lowell, on Thursday and Friday, May 2d and 3d.

The following gentlemen were proposed and elected active members of the Association:

W. W. Russell, Haverhill; A. T. Bigelow, Clinton; Joseph Austin, Lawrence; A. W. Russ, Wm. T. Childs, and J. B. Prescott, Manchester; John Clough, Woburn; A. M. Dudley, So. Danvers; Charles N. Pierce, Portland; and H. C. Gill, Great Falls.

The following were elected as honorary members:

Prof. Geo. T. Barker, Philadelphia; Dr. A. A. Cook, of Milford; and Dr. Carlton Kimball, of Portland.

The following were elected as delegates to the American Dental Association, viz.:

Drs. S. L. Ward, G. A. Young, John Clough, D. D. Ingalls, Thos. Palmer, J. A. Perkins, A. A. Russ, Joseph Austin, and Wm. H. Noyes.

Dr. Ingalls, of Clinton, read an essay on the subject of Conservative Dentistry, for which a vote of thanks was passed by the Association. A discussion upon the same subject was warmly entered upon by Profs. Barker, Atkinson, Buckingham, and others.

In the afternoon, Dr. Wetherbee gave a clinical lecture, operating upon Dr. Ambrose Lawrence, and plugging for him the pulp cavity of the right superior cuspid. This operation gave rise to a sharp discussion on the use of creosote, Dr. Wetherbee contending that the application, under

some circumstances, might produce inflammation; others contending that when applied to the cavity in a tooth, it never did nor could produce it.

A communication was received from the Massachusetts Dental Society, recommending the publication of a New England dental magazine, and urging the appointment of an editor from each local organization. The matter of co-operation in the movement was referred to a committee, consisting of Drs. Gerry, Ingalls, and Porter.

The committee subsequently recommended that the matter be referred to the president, to act in the matter as his judgment may dictate, and, if the Society united in the enterprise, to act as editor on the part of the Association until the next meeting, which recommendation was adopted.

Dr. Cummings offered the following resolution, which was adopted:

Resolved, That we, the Dentists of the Merrimack Valley Dental Association, tender our sincere thanks to Dr. S. and A. Lawrence, for their services and influence before the Legislature of Massachusetts, to prevent the Vulcanite Company from obtaining a charter, whereby they could better carry out their unjust extortion upon the dentists of this country; and that we call the attention of members of the profession residing in other States to the importance of defeating the efforts of these parties to obtain an act of incorporation from some other State legislature.

Dr. Locke, of Nashua, offered the following resolution, which was adopted:

Whereas, The Dental Vulcanite Company have failed to fulfill their agreement to compel all the dentists in the country, who use the rubber base, to take licenses and pay tribute to them; *And whereas*, The claims of said company are yet to be adjudicated in the United States Supreme Court before it will be known that they have any right to tax us; *And whereas*, We consider that every dollar paid to said company before the final decision serves but to fasten the monopoly upon us; therefore

Resolved, That we, as members of the Merrimack Valley Dental Association, respectfully invite the special attention of the Massachusetts Dental Society to this subject for some definite and decided action.

During the session Prof. Atkinson read two able papers, one upon the Circulation of the Blood, and the other on Histology, which were afterward made subjects of discussion.

It was voted to hold the next meeting in Lowell, and Drs. Locke and S. Lawrence were appointed essayists for the meeting.

THE ST. LOUIS ODONTOLOGICAL SOCIETY.

This Society was formed some two years since, and has held trimonthly meetings ever since. The officers are Dr. Joseph Payne, President; Dr. Trournicht, Vice-President; Dr. Hibler, Treasurer, and Dr. Geo H. Silvers, Secretary.

GEO. H. SILVERS, *Secretary.*

CIRCULAR.

The Iowa State Dental Society will hold its next session at Lyons, on Tuesday, July 9th, at 7½ o'clock P.M. There will be a session of two whole days. You are earnestly invited to attend, and take an active part in the proceedings. If you have microscopical specimens of teeth, dental curiosities, new or improved instruments, casts of malformations, etc. etc., please bring them. Those having microscopes of 300 diameters or over, are requested to bring them. *Write out* and report any interesting cases that you may have had. *Volunteer* essays are called for.

Essayists have been appointed on a variety of practical subjects, and in addition there will be discussions on subjects of interest to the profession.

Several distinguished dentists are expected from abroad. Do not let *business* keep you from the meeting. We hope it will be the best one that we have ever had, and this is saying a great deal. It is a duty that we owe to ourselves, to our patients, and to our chosen profession, to elevate and improve ourselves and each other in everything that pertains to the science of dentistry. Fraternally yours,

H. S. Chase, *Cor. Sec.*

OBITUARY.

Died, at his residence on Walnut Street, on Friday, April 15th, Dr. Frederick Reinstein, aged 70 years. It is with regret we are called upon to record the decease of one of the veterans in the profession.

Dr. Reinstein commenced the practice of dentistry in the City of Lancaster in connection with Dr. Parry of that city. Philadelphia offering a wider field for his usefulness and skill, he commenced practice in Philadelphia in 1839. He enjoyed the confidence and patronage of a large portion of the community and the profession. He was a progressive man, and encouraged the associations and improvements of the age. He was among the first members of the Pennsylvania Association of Surgeon Dentists, and acted as its treasurer for several years. His retiring and modest disposition, and failing health, prevented him from very active participation in the line of his profession for the last five years; nevertheless he died in harness. None knew him but to love him. H.

BIBLIOGRAPHICAL.

The American Journal of Dental Science. Edited by A. Snowden Piggot, A.M., M.D., and F. J. S. Gorgas, A.M., M.D., D.D.S. Vol. v., Third Series. Baltimore: Snowden & Coroman.

The first number of this magazine has been received from the editors,

and presents a fair and varied table of contents. In addition to other well-written communications, the article of Prof. Austin on "Facts and Philosophy of Dental Progress," in particular, is worthy of careful perusal. While appreciating the mental activities of the present age, particularly in respect to scientific advancement, he fully recognizes and directs attention to our obligations to the laborers of past ages, and how their efforts have paved the way for the brilliant discoveries and inventions of our day.

In the course of some editorial comments on the Association of the Colleges of Dentistry, it was somewhat surprising to find the following comments: "We confess to a feeling of disappointment that the editors of so widely circulated a journal as the DENTAL COSMOS should have passed over, without notice, certain minutes in those proceedings which record an action that must have a decided influence upon dental education."

The best evidence which could be afforded that the editor of the original department of the DENTAL COSMOS fully recognizes the importance of the matter referred to, was not only made manifest in the Association by a decided and uncompromising opposition to the conferring of degrees irregularly, but also is presented in the May number of the magazine, where the subject is calmly and dispassionately discussed by him, and while not hesitating to question the motives which have prompted the faculties of any college in the past or the present to adopt such a course, everything of a personal nature is studiously avoided. It so happened, that at the time when the Association was in session, on the 20th of March, all the matter in the April number of the DENTAL COSMOS was in the hands of the printer, according to a rule that everything must be in by the 15th, and there was no opportunity to present anything in relation to the Association until the May number.

The general arrangement and typography of the American Journal is unexceptionable, and its revival will no doubt bring out a number of writers who formerly contributed to its pages, and afford an additional medium of communication for young minds desirous of adding something to the general stock of knowledge, and under broad and liberal editorial management, exercise a salutary influence upon the literature of the profession. We sincerely wish it an extended sphere of usefulness, and many years of success. J. H. M'Q.

SELECTIONS.

LEGISLATIVE ACTION RELATIVE TO THE PRACTICE OF DENTISTRY.

To the Honorable the Legislature of the State of Kentucky.

Your petitioners would respectfully represent that Dental Surgery being a specialty of the healing art, requires for its proper performance

a knowledge of Anatomy, Physiology, Pathology, Therapeutics, Chemistry, and the theory and practice of Surgical and Mechanical Dentistry. The acquisition of a knowledge of these different branches requires at least two years of close application to study, with competent instructors.

Not until we are enlightened upon a subject can we appreciate the importance that attaches to it, and as the public have no means of judging between the competent and the incompetent dentist, they should, in justice, have some guarantee of qualification.

While the older and leading practitioners of Dental Surgery acknowledge *their need of more light*, the people of this Commonwealth are being grossly imposed upon by the *merest pretenders* to dental science, without possessing a knowledge of the first principles requisite to its successful practice; hence much suffering, discomfort, and ill health, results that might and should be averted.

Your petitioners, therefore, respectfully pray your honorable body to protect the citizens of the Commonwealth of Kentucky from injury by incompetent dental practitioners, by such enactments as in your wisdom you may deem sufficient.

A Bill to Regulate the Practic of Dentistry in the State of Kentucky.

Section 1. Be it enacted by the General Assembly of the State of Kentucky, That after the first day of January, 1868, it shall be unlawful for any person to practice Dentistry in the State of Kentucky, unless such person has received a diploma from the faculty of a Dental College duly incorporated under the laws of this or any other State of the United States, or a certificate of qualification from the State board of examiners hereinafter specified.

Sec. 2. Said board of examiners shall consist of three practitioners of dentistry, possessing the evidence of qualification contemplated in this Act. They shall be appointed, and vacancies filled by the Governor, by and with the consent of the Senate.

Sec. 3. The board of examiners shall serve for a term of three years, and until their successors are installed, except the members of the first board, one of whom shall serve for one year, one for two years, and one for three years.

Sec. 4. The board of examiners shall meet at least once a year, for the purpose of examining applicants; after having given at least sixty days' notice of such meeting in some newspaper of general circulation throughout the State. They shall also have power to make such arrangements as shall be necessary for the prompt and efficient performance of their work as such examiners.

Sec. 5. Any one member of the board of examiners, on a satisfactory examination of applicant, shall grant him permission to practice until the regular session of the board.

Sec. 6. Each applicant shall, on receiving a certificate from the board, pay into the treasury the sum of ten dollars, which fund shall be used by the board for the benefit of the dental profession in the State.

Sec. 7. Any person who shall practice Dentistry without having complied with the requisitions of this Act, shall, for each offense, be deemed guilty of a misdemeanor, and upon conviction thereof, shall be fined not less than ten dollars, nor more than fifty dollars; provided, that nothing

in this Act shall be construed to prevent physicians and surgeons from extracting teeth.

Sec. 8. All prosecutions under this Act shall be by indictment before the circuit court in the county where the offense shall have been committed, and all fines imposed and collected under this Act, shall be paid into the treasury of the county where such conviction shall take place, for the use of the common schools within such county.

Sec. 9. This Act shall take effect and be in force from and after its passage.

[Editorial comments on the above subject have been unavoidably crowded out of this number.]

MEDICAL AND SURGICAL REPORTER.

SURGICAL DEPARTMENT PHILADELPHIA DENTAL COLLEGE. Clinic of JAS. E. GARRETSON, M.D., D.D.S.—Reported by H. L. GILMOUR, D.D.S.—(Continued from page 552.)

I will remove one of these tumors, by passing the knife directly through it, thus dividing the cyst and contents into two parts; the sac is thus made very apparent, and is easily dissected from the integuments.

The other two I will remove by making incisions from the skin down to the sac, and thus enucleate them, about as one takes a walnut from its enveloping hull.

The three tumors were here sprayed, one after the other, and operations performed as described. Neither of the patients made the slightest complaint of pain. One, a man, said that he certainly felt it, but it felt, as he supposed it would feel to have one's boot cut from his foot.

Here, continued Dr. Garretson, is a lady, having a tumor upon the back of her neck, quite, as you see, the size of an ordinary orange. I think this will turn out to be a fatty tumor; it might be some other kind of growth, a fibrous tumor for instance, or even scirrhus, as signification is ordinarily attached to that word. A fatty tumor means simply a hypertrophy of the adipose deposit; it is always, however, a more or less distinctly defined tumor, and commonly has about it something which looks like an attempt at a cyst; indeed, I am sure I have seen these hypertrophies completely encysted. The removal of this tumor I will effect on the same principle as just employed, that is, I will cut down to the growth, dissect off its cover of integuments, and then securing control of the mass by passing a loop of twine through it, raise and dissect it from its bed; it will take some little time to do this, and the dissection will be considerable, so thus it affords a very fair test of what ether spray is worth.

The neck was now sprayed and the dissection commenced, the spray being made to follow the knife; attachment had formed to the trapezii muscles, thus even unexpectedly prolonging the operation. The patient, a lady, made no complaint, and did not seem to suffer any pain. Considerable venous hæmorrhage attended the operation, which, it was remarked, would have been much more considerable but for the use of the spray. The growth proved to be fatty and was surrounded by a very imperfect cyst. The hæmorrhage was entirely checked with alum water, and the wound, after being left open to glaze, was overlain by the integuments.

In closing wounds, the lecturer continued, made as these have been, the surgeon always aims after the most direct union. If I lay these flaps back into place nicely and kindly approximating them, and supporting the approximation; and, if I keep down all circulatory excitement, I will

secure, with the least effort on the part of nature, a complete reunion ; that is to say, that this glaze, which means a slight effusion of lymph, and which covers all parts of the wound, will intermix, as it were, will quickly organize and thus restore harmony of relationship; this is called securing union by first intention. Union by second intention, is the same thing prolonged. Where wounds are of such character that the parts cannot, or may not be brought thus closely in apposition, they cure themselves by a process of granulation; that is, layer after layer of lymph is thrown out, which organizes little by little, until finally the gap is filled up. In this mode of healing we have more or less suppuration, which means, that part of the lymph degenerates, or that, to express it differently, the pus is abortions of granulations. Thus, whether a wound having to unite by second intention heals rapidly, or with difficulty, depends altogether upon constitutional conditions, that is to say, if the local condition has proper treatment. To heal this wound I first carefully bring the edges together, not tightly, but indeed very loosely. I now take these two little compresses, which extend in width from the circumference to near the centre of the wound; these I soak in cold water and lay upon either side of the centre ; their office is to hold the flaps firmly in place, and they press just a little harder about the circumference than at the centre, for it is at the circumference that we want our most immediate union. You will at once perceive that it would not be good practice to consider alone the union of the lips of the wound, for should pus form under the flaps, at any part, the closed edges would have, of necessity, to be reopened. So it should always be the rule to unite from the circumference toward the centre. Now it is said that the use of the spray tends to make sloughs, and thus interferes with any immediate union. This has not been my experience, and I can only therefore infer, that the parts so sloughing must have been oversprayed, and thus disorganized. We will direct that the seat of these different operations be kept wet with lead water and laudanum; in a week you shall see the result.

These cases were exhibited at an after clinic, and the most perfect union had been obtained in all of them by first intention, none of them making a single drop of pus.

British Journal of Dental Science—March, 1867.

Some remarks on the greater prevalence of caries of the teeth now than among the ancients. By James Bate.

It has been very wisely remarked by Combe that "No object can be presented to the philosophic mind more replete with interest than an inquiry into the causes of the differences of natural character." "Every one must feel the force of this remark, and not only assent to its truth, but also to the converse of the proposition, and agree that nothing can yield more pleasure to the philosophic mind than an inquiry into the effects which the natural character, with its accompanying habits and customs, produces on the human frame." (Nasmyth.) In no study can we derive a greater pleasure than in the part of the system I have taken for the subject of this paper. It is replete with a vast amount of instruction, so much so that I feel at the very outset inadequate to the task I have set myself; but still, I argue, if we can but throw the smallest possible light on any subject, I think every one is bound to add to the general store of knowledge, and I crave indulgence for any shortcomings.

The question is frequently asked of the dentist—What is the cause of the teeth decaying more than formerly ? This involves another, viz.: Is it a

fact that they do decay more rapidly than in the days that are past? If so, why? In this paper I shall endeavor to answer these questions.

If we examine the skulls of the ancients, I think it will be seen that the teeth are not found to be attacked with caries to so great an extent as in modern times. It will be remembered that in the jaw found at Abeville some years since, the teeth were very regular and *sound.* In all the ancient skulls that I have had the opportunity of examining, caries was the exception and not the rule. It has also been noticed in some that were exhumed in Lincolnshire, the teeth were *perfect*, and the maxillary development good. Mr. Mummery, who has had opportunities of seeing many taken from the old Celtic barrows in Kent, says: "Never, in one instance, could irregularity or *caries* be detected." I find also, in an account of a skull taken from a Roman burial-ground, in which it must have lain eighteen hundred years, caries *was* present; but, according to the authority above named, that is a very common state of the skulls of the Roman colonists. He says: "They were *artificial* in their habits—they were a more cultivated set of people than the native Celts, among whom they came; and in a large number of Roman skulls * * * * you will find caries existing." Does not this prove that as civilization advanced, caries increased? Again, in a museum at Athens, in an upper jaw of an ancient cranium, a tooth filled with pure gold foil was found. The skull was found in one of the tombs which date from the days of ancient Greece. From this, it will appear that the ancients were not exempt from caries, and that the art of the dentist was employed in the same manner and for the same purpose as now. These cases only prove the exception, not the rule. In the crypt of Hythe Church, Kent, a great number of skulls are collected; the tradition states that they had been gathered together and placed there after a great battle between the Danes and Saxons; but this is disputed by many writers. However, be this as it may, there is no doubt they are of ancient date. The teeth are remarkable for regularity and quality. Caries existed, but to a far less extent than is seen in the present day. (Cartwright and Coleman.) In a specimen of a portion of a lower jaw from Pompeii, exhibited by Mr. Vidler, there is seen the same kind of disease attacking the first permanent molar, as is met with in the present day.

Be it remarked that all the jaws of the ancients are well developed, irregularity almost entirely unknown, and the teeth themselves well formed, and, as it has been stated of those in the Hythe crypt, the enamel was compact and evenly distributed over the dentine, which was dense and of the yellow variety, indicative of strength and durability.

I have not had the opportunity personally of inspecting many ancient skulls, but those few that I have examined tend to confirm that the teeth of the ancients were not liable to decay to so great an extent as at the present time. I have also, in my intercourse with those who have had the opportunity of seeing ancient skulls, and from reading, had ample proof of the above facts.

Again, in America, the skulls of the aborigines show almost a perfect immunity from caries, the jaws are well developed, and the teeth regular.

Baron Humboldt, in speaking of the Caribs and other coast Indians, said that he was almost inclined to class them as ruminants, from the time occupied in the mastication of their food; at the same time, testifies to the perfect beauty and soundness of their teeth.

Dr. E. Smilie, of San Francisco, states of the Indian tribes of North and South America of the present day, that "their teeth are sound

and regular, with pearly whiteness, secured by the friction of the natural dentifrice of tenacious food, slowly and thoroughly chewed, the liberated saliva washing away every adhesive particle."

My brother, Mr. Spence Bate, has been informed by an officer (a surgeon in one of the ships of the Franklin expedition in the Arctic regions) that he never saw a decayed tooth among the Esquimaux, although he had made his observations on both living and dead subjects.

Dr. Paraum, some years ago, reported to the Danish Government, on the health of the inhabitants of the Faroe Islands, in which he stated that it was common to meet people of the age of seventy who had not lost a tooth. (Lancet.)

We will now endeavor to ascertain the cause why there should be so much more disease now than formerly. It will be seen that all ancient jaws are more regularly and fully developed than those of the present generation. With regard to those that were examined at Hythe, there was "in no case anything seen like the contracted arches, so common in these days." No one will for one moment dispute that the contracted arch produces crowded teeth, and this in consequence predisposes them to decay.

To what, then, are we to attribute the present frequent deformity of the maxilla? This is a question more easily asked than answered.

But, so far as I have been able to judge, I think there can be no doubt that it, and consequently the decay of the teeth, is in a great measure attributable to the highly artificial manner in which we live—the highly seasoned food, and the fearful extent to which adulteration is carried in our condiments. As it has elsewhere been remarked, the most nourishing, and consequently bone-making qualities, are taken from the flour, it being too finely sifted, and alum added in great quantities to whiten the bread.

The science of physiology reveals to us the cause of all this, viz., that every part of the body, bones, muscles, etc., are produced from the blood, which is formed from the nourishment taken, viz. the food. This, to be of any benefit, requires to be properly and thoroughly masticated, so as to mix freely with the saliva, which assists in its deglutition and digestion; it is then conveyed to the stomach, there to be converted into blood, from whence it is sent to the heart, then to the lungs to be arterialized; which process cannot be thoroughly done unless a due and proper supply of pure air be inhaled, as it is the oxygen which gives vital properties to the blood, to keep up the supply of the waste ever going on in every part of the body; therefore it necessarily follows that the teeth as well as other members of the body must suffer and become diseased if the blood is impure. It will be clearly seen that the blood cannot possibly be pure and good, and perform its function, unless the pabulum contains all the necessary ingredients, and consequently disease must inevitably ensue. Now, I ask, does the food we eat contain all the necessary bone and muscle-making materials? There is but one answer to this—No. As I have before remarked, the bread which ought to be the staff of life has its most nourishing qualities taken from it. Again, in the cooking, etc., much is done to destroy the digestive and nutritive qualities of the food. For instance, meat cooked over two or three times, and flavored with various spices and sauces, loses its nourishing properties. Again, in the various pickles copperas is used to impart the green color; and no one will for one moment doubt but what that must be most detrimental to health.

PERISCOPE OF MEDICAL AND GENERAL SCIENCE IN THEIR RELATIONS TO DENTISTRY.

BY GEO. J. ZIEGLER, M.D.

"'*Styptic Colloid.*' *A New Styptic and Adhesive Fluid.* By BENJAMIN W. RICHARDSON, M.A., M.D., F.R.C.P., Senior Physician to the Royal Infirmary for Diseases of the Chest.—In this lecture I propose to take up a very simple subject, and yet a subject of first importance in one department of our common work. I am about to call your attention to a common fluid for instant and ready use in the dressing of wounded surfaces: a compound which is at one and the same time a styptic, an antiseptic, and a complete means of excluding wounded, abraded, or ulcerated parts of the body from the influence of the external air.

"My mind was led to this matter as long back as the year 1852. In that year Signor Pagliari, of Rome, announced the discovery of a new styptic, possessing, as he asserted, remarkable properties for arresting hæmorrhage. Having made some of this solution, I subjected it to careful experiment, and reported the results to the Medical Society of London. The report based on the facts elicited was not favorable to the new remedy, and as other experience of it confirmed my own it soon lost the popularity that at first surrounded it. The styptic of Pagliari was composed as follows:

"*Gum Benzoin, eight ounces;*
"*Alum, one pound;*
"*Water, eight pints.*

The alum and the benzoin were boiled for eight hours in water, fresh water being added to make up the loss by boiling. The solution as a styptic was found inferior to lunar caustic, but it was superior to a simple solution of alum. It was antiseptic, but was not adhesive.

"In succeeding years I made several attempts to produce a better fluid; but it was not until last year, when I was specially studying the applications of ether to practice, that I saw the true principles on which to proceed.

"The use of collodion, or gun-cotton dissolved in ether, had for some years been recognized as of great service in covering wounds, and as I found that collodion was very easily diffusible in the form of spray, it seemed to me that it might be applied in that form with advantage, and might even be made to coat a bleeding open surface. But on experiment it came out that in whatever way applied, collodion fulfills but a small part of the required duty as a styptic and a wound-healer. In the first place, it mixes indifferently with blood; in the second place, it forms but an imperfect adhesion; and lastly, it allows the transudation of air through its structure when laid upon a moist surface, and particularly upon the body, which is at all times throwing off watery vapor. At the same time the principle of the collodion process was excellent: to lay down from a fluid a deposit of solid matter by the evaporation of a volatile solvent was sound and beautiful action

"The next point in advance, therefore, was to combine, if possible, with the ether and gun-cotton some other substance which, being also

soluble in ether and capable of deposit by the evaporation of the ether, would combine chemically with the blood, with the albuminous exudative matter of a wound, or with purulent matter.

"The idea only was wanted to secure the object in view. There was one substance which answered all these indications—I mean tannin. A mixture, therefore, of xyloidine, a substance resembling gun-cotton, and of tannin was formed into solution with ether, and from that came what I designated '*xylo-styptic ether.*'

"Brought into practice, the advantages of this solution as a means for stopping hæmorrhage at once became obvious. Indeed, as a means for the arrest of hæmorrhage, less than the application of a ligature to an open vessel, the spray leaves little to be desired. The extreme cold produced by the evaporation of the ether acts directly on the water of the blood, the tannin solidifies the blood by combining with it, and the cotton acts as a plug: thus every indication for arrest of hæmorrhage is secured.

"But in observing the action of the styptic spray, I soon became impressed with another fact, viz.: that after the application to decomposing and fetid wounds and sores, the fetor entirely disappeared, the wounds commenced to heal with great rapidity, and a kind of natural covering appeared to form out of the secretion by its combination with the dressing above it.

"This observation has led me to simplify the application still further until it has come into this convenient form, a mere solution capable of being kept on the table as gum is kept, and of being applied with a soft brush in the same simple way.

"The process of manufacture of the fluid is tedious, but sufficiently easy. The object to be aimed at is to saturate ether entirely with tannin and a colloidal substance, xyloidine or gun-cotton. In the first step of the process, the tannin, rendered as pure as it can be, is treated with absolute alcohol, and is made to digest in the alcohol for several days. Then the ether, also absolute, is added until the whole of the thick alcoholic mixture is rendered quite fluid. Next the colloidal substance is put in until it ceases readily to dissolve. For the sake of its very agreeable odor, a little tincture of benzoin is finally admixed.

"The solution is now ready for use. It can be applied directly with a brush, or, mixed with equal quantities of ether, it can be applied in the form of a spray. In order to give to the fluid a short name by which it may be known, I have called it '*styptic colloid.*'

"*Properties.* When the solution is brought into contact with an open surface of the body, the resultant phenomena are these: the heat of the body gradually volatilizes the ether and the alcohol, and the tannin and cotton, as the ether leaves them, are thus left stranded on the surface in intimate combination. In proportion as the ether passes off, the blood or the secretion of the surface permeates the tannin and cotton; but tannin acts directly upon albumen, coagulating it, and transforming it into a kind of membrane, almost like leather. The cotton meanwhile unites the whole, gives substance to the mass, and adhesive quality. When all is solidified, the dressing becomes, in fact, a concrete, having a true organic hold or basis on the tissue; and as the tannin, if the solution be freely applied, is in excess, any new exudative matter or blood is for several hours taken up by it, and the annealing is made the more complete.

"Thus, by this dressing, the air is excluded from every possible point in every possible direction, not by a mere septum, but by the combination of the animal fluids with the remedy; and because the air is excluded and fluid is absorbed there is no decomposition—*i.e.* no oxidation; and because there is no oxidation there is no irritation.

"The styptic and adhesive qualities of this fluid are easily demonstrated by observing its direct action on blood, on serum, on pus, on albumen. You will see that it solidifies all these by mere contact with them.

"To these properties I must also add that of complete deodorization. Here is putrid blood, here putrid ovarian serum, here putrid purulent substance. They are unapproachable when laid on an open surface, but we bring them into contact with the solution, and they are deodorized. Further, the decomposed substance is fixed by the tannin and rendered inert.

"*Modes of Application.* Having thus laid down the principles at work in this method of treatment, let me next pass to the modes of application. I have here an artificial limb; a portion of it is covered with thin skin to represent the ordinary skin. At one part, for the space of six inches by four, there is placed under the skin a spongy substance charged with blood and albuminous fluid. I will now make an incision through the skin, and expose the bleeding surface. Suppose this to be an open wound, the two flaps of an amputation. I close it with silk ligatures in five places. This done, I take a little cotton-wool, tease it out finely in a wineglass, and saturate it with the styptic solution. Next, with a soft camel-hair brush, I apply the solution freely over the closed wound, letting it lie between the edges. If blood exude, it simply combines with the solution, making a mass much like red wax. I lay on the solution also for a little distance beyond the wound, and wait a few moments to allow for the evaporation of ether. Next I take from the wineglass the saturated cotton-wool with forceps, and lay a seam of it half an inch wide and the eighth of an inch in thickness over the line of incision. Finally, I coat the whole over with another layer of the solution, wait until the layer is nearly dry, cover with a little dry cotton, and, if pressure be necessary, carry over the whole a bandage.

"If time is a matter of importance, the evaporation of the fluid can be hastened by gently blowing with the warm breath over the solution as each layer of it is applied with the brush.

"Presuming that a cavity has to be treated, the fluid is often more neatly and handily used as spray. Thus, in treating the roof of the mouth for carious bone, or in plugging a bleeding alveolar cavity after extraction of a tooth, the spray is excellent. We begin in such a case by applying the spray direct to the bleeding surface, and when a layer of deposit is formed we use that as a foundation for a thin layer of cotton-wool ready saturated in the solution. Then we reapply the spray, and again cotton, until the whole operation is complete.

"For bleeding or fetid discharge from the uterus or vagina the spray is not advisable, because of the introduction of air. Here injection by the syringe is the best process, followed, if need be, by a plug of cotton-wool saturated with the solution.

"In cases of compound fracture, after the parts have been brought into apposition as far as is possible and fixed in the necessary position, the fluid should be poured slowly into the open cavity so as to fill it. Then

the parts externally should be covered with a layer of cotton-wool saturated with the solution.

"On open cancer, and on suppurating or decomposing surfaces, the solution may be freely applied with the brush, and afterward the parts may be covered with cotton-wool saturated with the fluid.

"In no case need there be any fear that irritation will follow the application of the solution. On the contrary, the action of it is so purely negative that it might be considered a sedative. It is not such in the technical sense of the term, but it so effectually covers the wounded and susceptible surfaces as to maintain what is virtually a sedative influence.

"After a fresh wound has been once dressed with this solution, it requires but little further treatment. In the case of small wounds they may be safely left with one dressing. In process of cure the dressing will slowly be thrown off in the form of a thick scale, and ligatures will also spontaneously come away. Even when the wound is very large, as after amputation, it is not desirable to try to open the wound unless there be systemic symptoms. In such case, in order to remove the dressing without pain, the bandage, if it be adherent, must be sponged at the adherent parts with a mixture of alcohol and ether, or with alcohol and water; this will set everything at liberty with ease and cleanliness. Water alone must on no account be used, neither hot nor cold.

"THE FLUID IN PRACTICE.—From these directions I may now move to the recital of a few typical cases in which this solution has been employed.

"*Hæmorrhage after Tooth Extraction.* At the request of my friend, Mr. Thomas A. Rogers, of Hanover Square, I was summoned, on May 9th, 1866, at 10 A. M., to see a young gentleman who was suffering from a dangerous hæmorrhage from an alveolar cavity from which a large molar tooth had been extracted. Mr. Rogers had extracted the tooth at 5 o'clock on the previous evening, and from then until my arrival the bleeding had never ceased. I learned from the parents that all their children suffered from the hæmorrhagic tendency in an extreme degree. The young man was now in a state of very great exhaustion, and the flow of fluid blood was still continuous. Laying him upon the floor, with his head raised, I applied the styptic, in the form of spray, directly into the bleeding cavity, and with such force at first as to dislodge the little pool of blood there. Continuing the spray, I was soon gratified at seeing complete arrest of the hæmorrhage. I now placed in the cavity a small pledget of cotton-wool saturated with the fluid, pressed it firmly home, and covered it with spray; thus, layer upon layer, I not only filled the cavity with cotton-wool and firmly-set styptic, but builded up the space between the two adjoining teeth with the same substances until the gap in the middle looked as if filled with what the dentists call a bone block. The bleeding was entirely arrested from that moment, and recovery was perfect. There was no sign of irritation in the wound, and when, four days afterward, the plug came away, all the structures beneath were healed.

"*Severe Hæmorrhage from Necrosis of the Upper Maxilla.* A gentleman suffering from syphilis, extremely aggravated by excess of mercury, was last year brought under the care of my friends Messrs. Musgrave and Milson, of St. John's-wood. I saw the patient with them in consultation many times, and we were all in much anxiety in regard to the roof of the mouth. The mucous membrane of the roof was thickened, red, perco-

lated, and offensive; the fetor was almost unbearable, and every evidence of necrosed bone was present. The soft covering of the palate at length gave way, the soft parts ulcerated, and about midnight on October 16, the necrosed bone loosened, and was partly displaced. In this way, the two descending palatine arteries were severed, and the most sudden and profuse hæmorrhage followed. I was summoned, and soon after my arrival, Mr. Milson also came. Unfortunately, we had to send some distance for the styptic fluid, but meanwhile we tried, quite ineffectually, to plug with the perchloride of iron, and were compelled to trust to pressure with the fingers. When the styptic arrived, we played it freely in the form of spray over the bleeding points, and with instant effect in stopping the loss of blood. Then we plugged carefully with cotton, saturating each layer with the spray, and soon the mass set firmly, and no more blood was lost. By the time we had controlled the bleeding, we were gratified by the arrival of Mr. Paget, whom we had summoned; and as he, from having already tried the styptic, was content to trust to it, we did no more. It is the fact that this patient lost five pints of blood before the fluid was used, but the hæmorrhage did not return, the fetor no longer was present; and a few days later, assisted by Mr. Milson, I removed the dead bone. The removal laid bare a wide ulcerated surface or cavity, which we continued to plug with the styptic on cotton-wool; and so perfect has been the healing process that the cavity would now bear an artificial plate.

"*In Open Ulcer.* The styptic solution is equally good in cases of ulceration in other parts of the body, and from other causes. The son of a medical man was brought to me with a large deep ulcer on the face. The boy had a strumous taint, and for three months various remedies had been applied without any avail. I simply painted over the surface of the ulcer freely with the solution, and ordered that it should be steadily applied whenever there was fresh oozing of purulent matter. The result toward cure was favorable beyond expectation, and in nineteen days the ulcer healed.

"*In Cancer.* My friend, the late Mr. Hitchman, of Leamington, consulted me in reference to a case of large open malignant ulcer of the breast in a woman of middle age. The discharge was most abundant, and the fetor intolerable. Here, again, I suggested the free use of the styptic solution, and with the most useful effect. Pain was soothed by it, the discharge was arrested, and the fetor was completely removed. The death of Mr. Hitchman has prevented me from knowing the result of the case, but in his last letter to me he reported that no previous treatment had given so much relief, and that the broken surface was contracting, and was, he thought, inclined to heal.

"*For Recent Wounds.* Leaving these cases of hæmorrhage and of ulceration, I pass to the effect of the fluid in promoting the healing of recent wounds.

"A lady, between 70 and 80 years of age, in coming from her bed-room caught her foot in the carpet and fell foremost on her head, receiving, by striking against a box, a large and severe wound on her forehead. The wound, triangular in shape, raised a portion of skin three inches long on two sides of the triangle. I treated the wound by putting in one suture at the apex of the triangle, and then painting the edges with the solution and covering them with cotton-wool saturated in the solution. Not another dressing was required; the wound healed at once without the slightest discharge, and leaving scarcely a scar.

"*In Amputation.* But the best case of recent wounds which I have to report is that of an amputation treated by the fluid as the dressing. The patient, a young gentleman, was under the care of Mr. W. Adams for extreme deformity of the foot, requiring amputation by Chopart's operation. The operation was performed on Wednesday, February 13th of this year, and as the cuboid bone and os calcis were anchylosed, the saw had to be freely used. Several vessels had to be tied, and the ligatures were left in the usual way, suspended from the wound. When the lips of the wound had been brought together by wire suture, I coated the wound freely with the fluid, and the bandage was applied. Three days later there was no fetor, no discharge, and no general symptoms, but as Mr. Adams was anxious to see the condition of the wound, I undressed it. To our delight, we found it healed throughout, but, unfortunately, from the bandage adhering to one of the long ligatures, I, in removing it there, tore open the newly healed wound for the space of a quarter inch. At this broken spot about a teaspoonful of purulent matter formed two days later; but this little break was very quickly reunited, and on the sixteenth day after the operation the patient was able to return to the country with complete healing by the first intention, and without having suffered from one symptom of a constitutional kind.

"I was never more indebted than to Mr. Adams for allowing me to put the fluid to this crucial test, nor can I thank him for this without also thanking him for permitting me to practice, and that also successfully, local anæsthesia by the ether spray in the first great cutting operations—viz.: for the removal of a portion of the femur, and for partial amputation of the hand.

"*Points of Practice in Dressing.* The case of amputation to which I have referred leads me to notice two points of practice in respect to the dressing of wounds. In another similar case, I should suggest that, so long as there is no fetor from the stump, no discharge, and no general symptom indicating the formation of pus, the part should not be touched nor interfered with in any way whatever for fourteen days. And, again, I would point out that should the surgeon feel it necessary to remove the dressing, he should scrupulously avoid the use of common water, either hot or cold. Water itself does not dissolve the styptic, and would only make trouble. The fluid to be used is a mixture of alcohol and ether, or equal parts of absolute alcohol and distilled water, warmed a little above the heat of the body.

"Another point of practice worthy of note is simple but important. It is, that it is not good to leave the styptic in large quantities within a wound that is about to be closed for healing by the first intention. Thus left it combines with the blood in the wound, and forms a hard substance, which sometimes produces friction, and so causes evolution of heat and pain.

"*Combinations with the Styptic Colloid.* I have treated so far on the styptic fluid in its simple form. I should add, however, that as a base it combines well with the following medicinal substances, as you will see by the specimens now sent round :

"*Creosote.* With the old creosote of the shops the fluid forms an excellent compound. The creosote acts well as an additional antiseptic, and also as a solidifier of albumen. It produces, however, some degree of irritation. The proportion is one minim of creosote to two drachms of solution.

"*Carbolic Acid.* With pure carbolic acid the fluid also combines. The compound so produced possesses the same properties as the mixture of creosote and the styptic. Five grains of the acid may be added to two drachms of the fluid. The combination is very powerful, but it produces some irritation.

"*Quinia.* The pure alkaloid quinia dissolves in styptic fluid, and forms a good solution in the proportion of one grain to the drachm. The quinia adds to the antiseptic power, but, I think, takes away from the adhesive property. Proportion, half a grain to a drachm.

"*Iodine.* Iodine unites readily with the fluid, and five, or even seven grains of it may be got into the quarter-ounce. The combination is most useful in cases where there is purulent or fetid discharge from a surface surrounded with indurated tissue. The iodine produces no irritation.

"*Iodide of Cadmium.* Iodide of potassium and iodide of ammonium do not readily combine with the styptic; but iodide of cadmium, which possesses a similar physiological action, goes up in it readily. Half a drachm of the salt will go up in an ounce of the solution.

"*Bichloride of Mercury.* The bichloride of mercury is soluble in the solution, and the compound, in the proportion of the one-twentieth of a grain to one drachm of the styptic, is a most useful application in indolent syphilitic ulcers. I think this application would also be useful in lupus.

"*Morphia.* Morphia goes up well in the solution, and in irritable painful ulcer a compound of morphia and the styptic, in proportion of half a grain of the alkaloid to a drachm of the fluid, is of service. Pain is at once relieved, and healing is promoted. This compound on cotton would be good for a stopping of a hollow tooth to relieve toothache.

"All the other narcotic alkaloids in their pure form go up in the solution—atropia, aconitina, and the rest. I have, however, no experience as to the value of such combinations in practice. This experience has yet to be learned.

"*Cantharidine.* This substance, on the addition of a little chloroform, can be taken up in the solution. The compound produces what may almost be called a dry blister, the fluid secreted being taken up as it is exuded by the styptic. There are cases in which this blistering fluid would be a considerable advantage; indeed, it would probably be an advantage in all cases in which a blister is required. Two to four grains may be used to the ounce.

"*Chloride of Zinc.* Chloride of zinc, which, in solution, has recently been used for the dressing even of recent wounds, makes a good compound with the styptic. Half a drachm of the salt dissolves readily in an ounce of the solution."—(*Med. Times and Gaz.*)

Transplantation of Tissue.—"Among the most recent and interesting vivisectional experiments are those of Paul Bert, Professor of Physiology at Bordeaux, on transplantation or animal grafting. The annals of medicine contain many curious facts, which for the most part are well authenticated and susceptible of repetition, showing that various tissues, various histological elements not grouped in tissues, and various parts composed of several tissues, may, after removal, be restored to their usual positions and continue their normal manifestations of life. So also when, after their removal, they are transplanted to a different and abnormal position

on the same animal, an animal of the same species, to an animal of kindred species, and, in some instances, to animals of even a different species, parts so transplanted have continued their development and growth. Among the successful transplantations recorded are hairs, feathers, cocks' spurs, blood, red globules, periostial cells, periosteum, cells of medulla of bone, bone, teeth, muscle, nerve, skin, nose, ears, cheek, chin, tails, paws, spleen, testicles, stomach, womb, jaws, fingers, and entire members. Some of these reported successes, as for instance the transplantation of feathers to the mammalia, are called in question by Prof. Bert, as well as by his predecessors. To this list, however, must be added the undoubted and interesting fact that he has several times succeeded in producing artificial Siamese twins. The denuded sides of two white rats, kept in close apposition, united by first intention in five days. The vascular union, through the band of junction, was so completely established, that atropine administered to one dilated the pupils of both animals, and after death an injection into the general circulation of one passed through this band into the general circulation of the other. Before abandoning this record of successful transplantations, let it be remembered that nature herself prepares daily the most successful and interesting of all such experiments, the grafting in the womb of the vivified ovum. Transplantations require, for their success, that they should be accomplished between animals of the same or closely allied species. However, Hunter and Sir A. Cooper succeeded in transplanting a human tooth to a cock's comb (specimen in the Hunterian Museum, showing vascular connection between the two); several have transposed to the same place a bird's wing and a cat's tail, and the periosteum of a dog transferred to a rabbit, and of a rabbit to a chicken, has given evidence of osseous development. * * * * * There seems to be little reason to doubt that every element of which a living body is composed may continue to live after transplantation, provided that it be transferred to a medium where it can obtain its ordinary nourishment, and that the transplantation does not destroy those conditions upon which its existence depends.

"The chief object of Dr. Bert's experiments was to test the vital resistance of the tissues; to subject the transplanted part, while *in transitu*, to such experiments as might throw light on its peculiar vital properties; on the part played by it in the phenomena of life, and on the modifications resulting from its removal from some of its normal influences, as the nervous centres. The results reported are certainly not such as would have been anticipated. A rat's tail, separated from its body, preserved in confined air, and protected from desiccation, lives when transplanted, if the temperature has not been above 53° (F.), from two to seven days; if the temperature has been at 77° it dies in two days; if at 86° in seven and a half hours. A temperature of over 130° or 0° does not kill the part. A moderately strong electric current, continued for seventeen hours, does not kill the part to be transplanted. Desiccation as complete as scientific means permit does not entirely destroy its vitality. A prolonged exposure to oxygen, carbonic acid, nitrogen, hydrogen, carbonic oxide, vapors of phrenic acid, benzine, ammonia, and of ether do not destroy life in the graft; though disease is often thereby inflicted on it. Immersion in water impairs the vitality of the anatomical elements more than their exposure to most of the gases. However, when the part has been immersed for nine hours in water at 65°, and below 32° it still gives evidence of life. Acids destroy the vitality of the tissues in doses very

much less than the alkalies. One part of acetic acid in one hundred parts of water kills in four hours, but two parts of potash, equally diluted, are perfectly inoffensive. This confirms the law already established, that it is necessary for the health and vitality of the tissues, that their nourishing fluid, the blood, should be alkaline. To the above almost incredible illustrations of the persistence of vitality, may be added the interesting facts, that the tail removed from a rat dead twenty-two hours, has been successfully transplanted to a living rat, and that Prof. Ollier successfully grafted upon a living rabbit periosteum taken from one dead for twenty-four hours, which performed its normal function of developing bone. * * * * That the nose, chin, eyelids, pulps of the fingers and teeth may be successfully restored, even some hours after their removal, is abundantly proved by the records of our own day; as also that lesions of the skin may be restored by transplantations from adjacent parts, its old connections not being entirely cut off, until it has established its new union. The records of the past tell us that noses have been restored by integument removed from the gluteal region, and that in one case the attempt was made with the skin from a body recently dead.

"Two of the subjects connected with transplantation deserve further attention, viz., the transfusion of blood, and the grafting of periosteum to form bone. By this latter Nelaton and Ollier have succeeded in giving a bony and solid base to an artificial nose; and the Berlin surgeon, Langenbeck, has acquired fame and money by closing up fissures of the bony palate with osseous tissue."—(DR. S. E. CHAILLE, *New Orleans Med. and Surg. Journ.*)

Hereditary Syphilis.—"The effects of *hereditary* syphilis on the system are somewhat different from those which I have described when the disease is acquired. Children who are born syphilitic are recognized by their impoverished look and by the morbid condition of the skin. On post-mortem examination, the liver may be found indurated, the lungs the subject of lobular pneumonia, and a peritonitis may exist, as first pointed out by Sir J. Simpson.

"When less severely affected, syphilitic children do not exhibit traces of the disease until some weeks after birth, when a roseolous or lichenous rash appears, accompanied by snuffles, ulceration about the mouth, condylomata, etc., and perhaps some inflammation of the structures of the eye.

"In about a twelvemonth these children get well, and until quite lately were supposed to be then altogether free of the syphilitic taint. It was supposed that hereditary syphilis was a purely infantile disorder, and that all traces of it disappeared after the period just named. It has, however, been shown by the long-continued and very accurate observations of Mr. Hutchinson that the disease by no means ends here, but after a few years its effects may again be witnessed, in a manner which has just been described to you, in the tertiary stages of the acquired disease, but still possessing some peculiarities. The novelty of the observations consists in the fact that a person may be suffering from the effects of hereditary syphilis in adult age, and at a period when it is possible he may acquire the disease for himself. In such cases, however, not only are the morbid processes seen in action, but the effects of those which occurred in childhood have left their indelible traces on the countenance. Thus, in a young person, say at the age of puberty, a syphilitic action may be

found still proceeding, although engendered at birth; and the subject very often exhibits the hereditary taint in his person. He is often puny or ill-developed, as was seen in two young men who were lately in the hospital; although in a girl who evidently was the subject of hereditary syphilis, the general conformation was good. These puny lads had the configuraton which Mr. Hutchinson has so well described. There were the protuberant forehead, indicative of the ventricular effusion which had occurred in infancy; the peculiar flattening of the nose, induced by the inflammation of the mucous membrane and periosteum; the puckering around the mouth, from cicatrization of former ulceration; and, above all, the peculiarities presented by the teeth. Owing to the pulps of the permanent teeth having been involved in the inflammation at an early period of childhood, the formation of the teeth becomes altered, seen especially in the incisors; these are dwarfed, rounded, narrowed, and notched. With regard to the teeth, you are no doubt aware that much skepticism exists as to the correctness of the observations that have been made, and therefore I may remark that having had my attention early drawn to the subject by Mr. Hutchinson, I have taken many opportunities of testing its truth, and I have not the slightest hesitation in giving in my adhesion to his views in every particular. Not uncommonly the shafts of the bones are found of inordinate size, from the chronic induration which has been for many years in progress. Besides these marked effects of former morbid processes, we may find that the fire is still burning, that ulcerations may occur in the throat, that a fresh periostitis may break out, and at the same time an affection of the eye, which appears to be peculiar to this form of hereditary syphilis. It is seldom seen before the fifth year, and consists of a cloudiness coming over the eye, due to an infiltration of the cornea with lymph, and which is technically styled 'interstitial keratitis.' Sometimes also the patient may be deaf. At a later stage, these patients come before us with dropsy and albuminuria, and we find they are the subjects of the lardaceous disease before mentioned."
—(Dr. Samuel Wilks on Syphilis—*Lancet.*)

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"*Chemical Constitution of the Salivary Calculus presented to the Surgical Society of Ireland, by* Dr. Leech.—Report of the committee was read by Dr. Mapother, as follows:

"'One-third of the portion given was heated in the flame of a spirit-lamp, when it blackened, and emitted the burnt-feather smell characteristic of the nitrogenized compounds. Its organic matter was, therefore, presumably, dried mucus. By further heat the mass became white, the carbon being oxidized, and the ash was alkaline from lime. By complete incineration the loss of weight was one-twelfth.

"'The inorganic constituents were carbonate of lime and phosphate of lime, respectively, in the proportion of two-thirds and one-third. The quantity being so small, an exact quantitative determination was not attempted, but the percentage may be roughly stated as follows:

Carbonate of lime	60
Phosphate of lime	30
Organic matter (probably mucus)	8

"'The remaining portion was boiled in distilled water, and the liquor

was tested on a white slab with persulphate of iron. No trace of sulphocyanide of potassium appeared.'

"In another submaxillary calculus which I examined in 1863, there was no carbonate of lime

"The compositions of those analyzed by various chemists are as follows:

	Wright.			Von Bibra	Lecanu.
Carbonate of lime	81	79	80	13	20
Phosphate of lime	4	5	4	38	75
Soluble salts	6	4	5	38	5
Animal matter	7	8	8		

"Those from the horse contained:

	Lassaigne.	Henry.
Carbonate of lime	84	85
Phosphate of lime	3	4
Organic matter	9	2

"No analyst mentions that sulphocyanide of potassium was present, which, even if originally present, would dissolve out in the fluids of the mouth. It will be seen from the above widely diverse analyses, that concretions deposited from saliva differ almost as widely as those formed from urine, at least with regard to the proportions of their constituents.

"Dr. Mapother likewise added, that he understood Dr. Jameson possessed two salivary calculi, and perhaps, if he had brought them down with him that evening, he would kindly let the Society see them.

"Dr. Jameson said he had brought the specimens with him, having heard that such a subject would be before the Society. They were two very excellent examples of salivary calculi. One was extracted by himself from their old friend Jerome Morgan. He had been suffering a great deal of distress and inconvenience from a swelling in the sublingual region. He (Dr. Jameson) cut down on it, and extracted this calculus. He had a part of it analyzed, but he forgot with what results. The other specimen was also a very beautiful one, and had been extracted from a similar situation under the tongue. There was a regular ball-and-socket joint formed between the two portions of the calculus. This specimen was given him by Mr. Edward Dillon, the demonstrator, a few days after he (Dr. Jameson) had extracted the calculus from Dr. Morgan's sublingual region.

"Dr. Leech said the calculus he removed had a ball-and-socket joint also, and likewise a nucleus.

"Dr. Jameson observed that there was a nucleus in the centre of the calculus which he had extracted.

"The chairman said they had to thank the gentlemen who had made the analysis of Dr. Leech's calculus. The sulphocyanide of potassium was not detected, in the first instance, by the gentleman who analyzed a very small portion of the calculus. A doubt having been thrown out whether that peculiar salt might not have escaped his observation, a larger portion was kindly given by Dr. Leech, which having been subjected to examination by three most competent analysts, the original analysis was confirmed. The specimens shown by Dr. Jameson were very typical ones. The largest of them did not, however, approximate to the size of that exhibited by Dr. Leech. He had, himself, seen specimens very nearly as large as it. He thought when the calculi arrived at a certain size they were broken by the motion of the tongue, and the ball-and-socket joint

was then formed by the movements of that organ."—(*Dublin Medical Press.*)

"*Softening of Inferior Dental Nerve; Exostosis of Infra-orbital Canal; Trephining; Cure.* PROF. GREENE'S Clinic in the Medical School of Maine. Reported by H. H. KIMBALL, M.D., Professor of Surgery.—Mrs. W., aged 54. About three years ago, she began to suffer from pain at the angle of the lower jaw on the right side. This was paroxysmal in its character; but the attacks were so frequent and severe as to unfit her for usefulness or enjoyment. Her sufferings had been much increased during the past year, and the pain now affected the whole side of the face, being quite severe in the *infra-* and *supra-*orbital regions. There was no tenderness or swelling; no apparent derangement of the general health that was not referable to the local suffering. She had undergone most thorough medical treatment, both general and local, in the hands of good physicians, with no avail. Hypodermic injections of morphine and atropia had failed to afford any marked relief. Prof. Greene said, that from the fact that there was no failure of the general health previous to the local trouble, and none now except the debility, fairly attributable to the long-continued pain, and also the fact that the various plans of treatment, whether alterative or tonic, combined with the most powerful anodynes, had failed, it was probable that the disease was local in its character. Whether the inferior dental nerve alone was involved, or whether the main trunk of the fifth pair was diseased, was doubtful, but as the pain was so completely localized at the angle of the jaw at the outset, and so remained for many months, the probabilities were that the pain along the other branches was reflex. At any rate, it was one of those cases where we are justified in trephining the jaw and exposing the nerve. We might find the nerve inflamed or softened, or pressed upon by a little bony tumor projecting within the dental canal. Oftentimes these cases were associated with and dependent upon ostitis or caries, but here there was no evidence of diseased bone. The two last molars had been extracted years before, but the parts seemed healthy. Dr. G. had operated in one case where the nerve and the surrounding bone appeared perfectly healthy, but perfect relief followed division of the nerve.

"Ether was given, and a curved incision, with its convexity looking downward and backward, made over the angle of the jaw, the bone carefully exposed, and with a small trephine a button of bone removed, exposing the dental canal. The nerve was found so much softened as to lacerate readily when the attempt was made to raise it from its bed. The exposed portion was all removed, the wound closed with silver sutures, and a wet compress applied. The relief from pain at this point was immediate and complete. The lady slept well without anodynes, and in a week returned home well, with the exception of some pain still existing in the infra-orbital region.

"At the end of six weeks she returned, complaining of a great increase of suffering. The pain was well localized, and entirely neuralgic in its character. Ether was again administered, and by a curved incision the nerve was exposed at its exit from the infra-orbital foramen. It appeared to be perfectly healthy; but, upon cutting away the walls of the canal for half an inch, a little sharp exostosis was seen upon the right side, pressing upon and flattening the nerve. This was removed, the wound

closed, and simple dressing applied. The relief was immediate and complete. The patient remained well two months afterward, since which there is no report from her."—(*Boston Med. and Surg. Jour.*)

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Cystic Tumors of the Jaw.—In a notice of Dr. J. Mason Warren's work on "Surgical Observations, with Cases and Operations" (*Boston Med. and Surg. Jour.*), it is stated that four cases are reported, "successfully treated by an original method. Whereas the former practice had been to remove a portion of the jaw, our author's treatment consisted in 'puncturing the sac within the mouth, evacuating its contents, and at the same time obliterating the cavity by crushing in its walls; and, lastly, in keeping up, by injections, etc., a sufficient degree of irritation to favor the deposition of new bone. The comparative mildness of this mode of treatment, and the excellent character of the results, combine to award the preference for this operation over excision, or even the large external incision adopted by Dupuytren.'"

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Treatment of Necrosis.—"A novelty in the treatment of necrosis has been introduced by Sir Wm. Fergusson. The usual practice, of course, is doing nothing but watch the case until the dead bone is separated from the living, and then to cut down and extract it. But this, as every practical surgeon knows, is often a very tedious and difficult proceeding, chiefly on account of the large mass of new bone with which the sequestrum becomes overlaid and almost completely encased. The new plan is, as soon as ever there are indications of necrosis, to make an incision over the place down to the bone, dividing the periosteum. This incision prevents the external formation of new bone where the periosteum has been divided, so that when the sequestrum is ready for removal, this may be accomplished without difficulty, a passage in the new bone being left free for it. By this means the operation for removing the dead bone becomes much more certain and much less serious."—(*London Correspondent of Richmond Med. Journ.*)

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"*Regeneration of Bone.*—Some French *savans* have offered a prize of $4000 for the best essay on the 'regeneration of the bone.' They declare that experience and observation seem to indicate that amputation may be almost entirely superseded by the creation of new bone."—(*American Artisan.*)

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"*Rickety Bones of a Dog*, exhibited by Dr. Dick to the Pathological Society of London, in which, as a puppy, rickets had been artificially induced by early removal from its mother, and feeding it on bread and meat with only enough milk to keep it from starving altogether. The dog was an Italian greyhound.

"Mr. W. Adams stated that Dr. Dick's theory was that, by the improper dieting of children, an excess of phosphoric acid was formed, which carried off with it an excess of lime, and thus softened the bones. He questioned if rickets was ever congenital."—(*Med. Times and Gaz.*)

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Dental Caries in the Ape.—"At the Academie des Sciences, a paper was read by M. Bischoff, in which he stated, that he had, while examin-

ing skulls of anthromorphous apes, found that in four skulls out of seven of chimpanzees, many of the teeth, and some of the bones were carious. Among thirty skulls of the orang-outang, only one instance of caries was found, and this was clearly the result of an accidental blow. In one other old female orang, M. Bischoff found one carious tooth."—(*University Journ. Med. and Surgery.*)

"*Carbolic Acid and Glycerin.*—One part of the former to thirty of the latter, forms an excellent application in ulceration of the nose and throat, and in the fetid or ichorous discharges of cutaneous diseases."—(*Ibid.*)

Leprosy.—In his late Hunterian Oration, DR. WM. S. SAUNDERS says (*Med. Press and Circular*) that Dr. Thompson, an eminent American writer on the Holy Land, furnishes the following graphic description of the effects of this dreadful malady: "Sauntering down the Jaffa road, on my way to the Holy City, I was startled by the sudden apparition of a crowd of beggars, *sans* eyes, *sans* nose, *sans* hair, *sans* everything; they held up their *handless arms*, unearthly sounds gurgled through throats *without palates*, and, in a word, I stood horrified, when, for the first time, I found myself *face to face* with a leper.

"New-born babes of leprous parents are often as pretty and healthy in appearance as other children, but the '*scab*' comes on by degrees, the hair falls off, joint after joint of the fingers and toes shrink up, the gums are absorbed, and the teeth fall out and disappear; the nose, the eyes, the palate are slowly consumed, and finally the wretched victim sinks into the earth under a disease beyond the control of medicine, which cannot even mitigate its tortures."

Teeth swallowed; a safe Passage.—It is stated in the *Boston Med. and Surg. Journ.*, by W. H. TRAVER, M.D., Secretary, "that DR. MCGREGOR reported the following case to the Providence Medical Association. The patient, a female, awoke in the night with a sense of suffocation, produced by a vulcanized rubber plate, two and a half inches in length, one and a half inches wide, with four incisor teeth attached, which had lodged in the œsophagus. While struggling to relieve herself, the plate passed into the stomach. On the following day she experienced great pain in the epigastric region, accompanied by spasms, which continued from time to time until the plate passed per anum. The pain and spasms were relieved by sweet oil, McMunn's elixir of opium and the inhalation of chloroform. She was kept partially under the influence of the latter for twelve days, the time occupied in the passage of the plate."

Atmospheric Pressure at great heights insufficient to support Artificial Dentures.—The *Scientific American* states: "The City of Austin, Nevada, is six thousand feet above sea level, where the air is so thin that the least physical labor causes great shortness of breath, and the atmospheric pressure is so light that those of its four thousand inhabitants who find it necessary to wear artificial teeth, experience extreme difficulty in keeping their sets in position."

"*Disinfecting Powder.*—M. Demarquay employs the following powder, which may be applied without causing pain to ulcers emitting fetid

odors, as open cancer, for example: permanganate of potash, powdered carbonate of lime, and powdered starch, equal parts."—(*Union Med.* and *Med. Times and Gaz.*)

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Liquid Stone.—In a paper read before the Society of Natural History, Boston, on this subject, Prof. A. L. Fleury, of New York, observes (*Amer. Artisan*), that "the liquefaction of stone, the dissolving of hard refractory quartz or flint, like sugar or salt in water, the preparation of a colorless, mineral, and permanent petrifying liquid by economical means, and on a large scale, is a problem, the solution of which seems to belong to the present progressive century.

"The uses to which a perfect liquid flint, a hydrate of silica, could be turned are numerous and interesting, provided the liquid possesses the property of becoming insoluble in water after having been deprived of its water of solution, keeping back its water of crystallization.

"Metallurgy could be very materially benefited by a process whereby quarts could cheaply and speedily be dissolved in water; for we could then take the gold quartz of Nova Scotia, New Hampshire, or Canada, and dissolve the quartz, and obtain all the gold as a precipitate. Of course, as the liquid flint could be used for so many useful purposes, and be sold for a good price, the extraction of the gold would be very cheap, and, so saying, cost less than nothing, as the extraction price of the gold would be more than paid for by the amount realized from the sale or use of the liquid.

"Omitting the detail of the numerous attempts that have been made since 1823, when Prof. Fuchs, of Munich, Germany, first succeeded in preparing the so-called water-glass, and alkaline solution of silica in water, we will shortly glance over what has been done during the past ten years. It was at first believed that the German water-glass, prepared by melting from 20° to 40° of white quartz sand with soda or potassa and charcoal powder to a glass, soluble in boiling water, or by treating finely pulverized flint with a concentrated alkaline lye under pressure of steam, would answer all the purposes above stated; however, it was soon found that the carbonic acid of the atmosphere, by its stronger chemical affinity for the alkali of the silicate, caused a gradual disintegration of the surface or compound. Numerous remedies were suggested to counteract this evil. Prof. Kuhlman, in Lille, France, and Mr. Ransome, in Ipswich, England, partially succeeded by subsequent application of the solutions of chloride of calcium and hydrofluoric acid to the surface, or to the mass of the stones, to neutralize and extract the alkali, and Mr. Ransome, by the means of great pressure and proper manipulation, is preparing a brown or gray concrete stone of considerable hardness and durability.

"Prof. Graham, in London, by his beautiful discovery of dialysis, by which a crystallizable liquid can be separated from a viscous, or so-called colloid substance, first succeeded in separating silica from an alkaline silicate, and to keep it in perfect solution in water. However, the slowness of the process, and the small quantity of silica thus kept in solution, left this very ingenious and otherwise useful method without practical results. It is only recently, since the eminent French chemist, Fremy, has made a thorough scientific investigation into the nature and properties of *silicium* and its combinations with chlorine, fluorine, and sulphur, that the existence of several distinct hydrates of silica has become known.

"Prof. Benj. Hardinge, some twelve years since prepared, by a peculiar process not made public, a solution of silica in water, wherein the silica was largely in excess; and it is only recently that he has succeeded in producing not only a most perfect imitation of white and colored statuary marble, but also to make a *snow-white flint* of greater hardness and durability than the natural marble itself. He succeeded in mixing his compounds so that the exact amount of water of crystallization necessary for the formation of the stone was introduced, and the stone, *cast cold, without pressure, becomes hard from the centre outward*, thus insuring durability and great compactness. This is the most remarkable success, and the nearest step toward the solution of our problem."

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Scientific Journal.—A Weekly Record of Scientific and Practical Information on Manufactures, Inventions, Mechanics, the Arts, etc. D'Epineul & Reed, Editors and Proprietors, Phila., aided by Gen. H. Pleasants, Prof. Van der Weyde, and E. Samuel. Three dollars per annum in advance.

This is a new and enterprising *Weekly*, devoted to the popular exposition of science and art. It is designed " to disseminate authentic information on subjects of scientific or industrial interest" by a "complete review of all that is new and interesting in the Scientific World, with full and explicit statements of late discoveries, and their adaptation to the arts." It is ably edited, richly supplied with useful knowledge, and deserves a liberal support. It is an acceptable addition to our exchange list.

The Science and Practice of Medicine. By William Aitken, M.D., Edin., Professor of Pathology in the Army Med. School, Corresponding Member of the Royal Imperial Society of Physicians of Vienna, of the Soc. of Med. and Nat. Hist. of Dresden, and of the Imperial Soc. of Medicine of Constantinople, etc. etc. In two vols., from the 4th London edition, with additions by Meredith Clymer, M.D., late Professor of the Institute and Practice of Medicine in the University of New York, formerly Consulting Physician to the Philadelphia Hospital, etc. Phila.: Lindsay & Blakiston, 1866.

In this very voluminous work the author presents "a condensed view of the science and practice of medicine."

The introductory sections are appropriated to the consideration of General Pathology and Nosology. The remainder is divided into three parts: the first treats of Systematic Medicine, Nosology, or the Classification of Diseases; the second, of the Nature of Diseases, Special Pathology, and Therapeutics; while the third is devoted to the subject of Medical Geography, or the Geographical Distribution of Health and Disease, undoubtedly "a most important department of the science of medicine," and one hitherto too much neglected.

This work is certainly a very learned and comprehensive compend. of the theory and practice of medicine, and will prove an invaluable aid to the acquisition of a competent knowledge of the same. It will be found extremely useful both as a text-book and a book for reference.

It is gotten up in excellent style, and should be in every professional library.

THE

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ORIGINAL COMMUNICATIONS.

FILLING CAVITIES IN THE APPROXIMAL SURFACES OF TEETH.

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Of all the operations which the dentist is called upon to perform, none require greater skill, or, as a general thing, are more imperfectly executed, than the preparation and filling of cavities in the approximal surfaces, particularly in the bicuspids and molars, when located at the necks of the teeth.

After the most thorough excavation of caries, and apparently most skillful manipulation of the gold, unless the greatest possible care has been exercised, defects not unfrequently exist which effectually defeat the ends desired. In some instances a sufficient quantity of material is not introduced in the cavity to entirely fill it, and a ledge is left at the neck of the tooth, where, by the retention and decomposition of food, caries will soon be re-established; while, in other cases, an excess of gold is used, and, in its consolidation, a portion projecting out of the cavity is forced against the gum, and, through oversight on the part of the operator, is permitted to remain, and become a source of intense irritation to the soft parts, followed by periostitis of the most aggravated character if the cause of trouble is not promptly removed.

A case in illustration of this came under my care, some time back, in which one of the most careful and skillful practitioners in the profession removed the pulp and filled the roots and a cavity in the distal or posterior approximal surface of an inferior second molar with gold. A short time after the tooth had been filled the patient called upon the operator, and complained of tenderness in the tooth, which he endeavored to allay by scarifying the gums—the tenderness, however, remained—

and in the course of a few days an intensely painful periostitis was established. In the mean time the gentleman who performed the operation was called out of town for a few days, and, my services having been desired, I called to see the patient, who was so much prostrated as to be unable to leave the house. Finding the pain so excruciating as not to admit of an examination with probes, and, indeed, the teeth were so close to each other that the most delicate would have been of no use under the circumstances, I contented myself with a general examination and the history of the treatment adopted with respect to the tooth; and then, at the urgent solicitation of the patient, extracted it, when the cause of trouble was made plainly evident, in a projecting portion of the filling which had impinged upon the surrounding soft parts.

In treating such cases it is advisable to obtain as much space as possible between the teeth before operating; for the majority of failures in this direction are due to the fact that operators make an attempt to perform their work without sufficient room for thorough manipulation. In securing the space required, the first and most important agents in this respect are wedges, either of wood, cotton, or caoutchouc. When it is possible, the end desired should be gained at one sitting (for there is nothing more annoying to most patients than to be compelled to wear a wedge of any material for a number of hours or days); this can generally be secured by inserting a wedge of orange wood between the teeth close to the gum before commencing to excavate the caries, and allowing it to remain until the operation is completed. Where it is absolutely necessary the file may be used to form in addition the V-shaped space so much in vogue. Through the abuse of this plan, however, the symmetry and usefulness of many teeth have been seriously impaired, and where possible it should be avoided. As I advocated years ago, by cutting away the grinding surfaces, ready access can be obtained to such cavities, and what would otherwise be difficult operations, with very unsatisfactory or doubtful sequences, can be converted into plain and easy work with the most certain results. To secure this, the most perfect cleansing and preparation of the cavity, particularly at the edges, is required, along with the most thorough condensation of the gold. The portion of gold introduced around the walls of the cavity demands special attention, and nowhere (as already intimated) more than at the necks of the teeth, where the greatest care should be exercised to have the filling *even* with the margins of the cavity. If the operation has been properly introduced, there will be no trouble in securing this with the aid of files, curved scalers, and burnishers.

After completing the operations, the importance of using the tooth-pick, whether of wood or quill, to remove all accumulations from between such space, cannot be too forcibly impressed upon the minds of patients. For carelessness in this respect often defeats the most

skillful efforts on the part of the dentist. Recognizing that both are indispensable, it must be admitted that, even with sound teeth, patients can better dispense with the tooth-brush than the tooth-pick, and this is still more the case in instances such as those under consideration. Indeed, the slovenly and imperfect manner in which the brush and tooth-pick are generally used, demands attention on the part of the profession, and where unmistakable evidence of that fact is manifested, not only on the part of children, but those of a larger growth, it is well to accompany sound advice by some practical demonstration in the mouth, showing how those useful articles should be used.

ARTICULATION OF ARTIFICIAL TEETH.

BY J. PAYNE, D.D.S., ST. LOUIS, MO.

THERE is no branch of the mechanical department of dentistry of more importance, and none perhaps so much neglected or so little understood, as the above. The impression may have been perfect, the mechanical execution exquisitely beautiful, the selection of the teeth as to style and color all that the finest discrimination could have desired, yet if the articulation is bad, the whole work is, comparatively speaking, a failure. What I am going to say has no reference to the method of taking the articulation or "bite" as it is called, as every dentist is presumed to understand this, but after this has been done, and the work finished and in the mouth, I propose to submit a plan by which the old practitioner may advance a step further, and produce a more perfect antagonism of the teeth than can be done by any other method. The articulation of the artificial substitute should be as nearly as possible equal to that of the best natural teeth, and the result can be obtained in the following manner. After finishing a full set of teeth, allow them to be worn a day or two so that the lips, cheeks, and tongue may become accustomed to the foreign work and assume their natural positions. It is necessary to see the patient occasionally to be sure that no irritation is caused by undue pressure of the edges of the plates; as this will be likely to produce pain and prevent the jaws closing with freedom. As soon as the work is easy in the mouth, direct the patient to open and close the jaws a few times to be satisfied that the teeth strike continuously in the same place. Having settled the preliminaries thus far, mix up some plaster and request the patient to close the teeth and hold them together, then spread the plaster on both upper and lower sets. At first it is best to use only a small quantity, and press pretty well through among the teeth, so as to make the fastening secure, and then add more till it is about a quarter of an inch thick. It is not necessary to put the plaster further back than about the second bicuspids or first molars. It is best to put it on the back teeth first,

leaving a few of the front teeth exposed till the last or altogether, so that if the patient should move the jaws it can be detected. Having finished the plastering, press a napkin gently against the plaster to absorb the moisture, and then let it rest till quite hard, after which remove the work carefully from the mouth. Now secure it in an articulator by means of plaster, and when hard enough for manipulation remove the plaster from the fronts of the teeth and brush them off clean.

The upper and lower sets of teeth are in their relative positions to each other precisely the same as they were when in the mouth, the articulator representing the jaws, and will open and close just as they do, except that it is secured against the liability of any lateral motion. In other words, that portion of the mouth which we wish to work at is divested of all the other parts, the cheeks, lips, and tongue, which so greatly obstruct us in attempting to articulate a set of teeth, and we also have the advantage of restricting the jaws to the perpendicular motion by which the teeth are obliged to close every time precisely in the same place. Next cut a lot of strips of very thin paper from an eighth to a quarter of an inch wide. I use for this purpose the books that contain tin foil, because this paper is very thin and easily torn, and it is best to use paper that will tear easily, and let the piece adhere to the tooth that tears it, so as to see the exact point that requires grinding. Now take one of these strips, open the jaws or articulator, place the paper between the last molars on one side and close the teeth on it; pull the paper, and proceed on around to the last molars on the other side, using the narrow strips for the bicuspids, the wider ones for the molars, and see how many teeth will tear the paper. You will probably be surprised to find that what was supposed to be a very fine articulation, will only tear the paper on one or two teeth in the twenty-eight. At first the defect is so glaring that it may be detected by simply holding the work up to the light, but after the teeth have been touched a few times on the corundum wheel and the defect partially removed, nothing except the paper will be a safe guide. Now grind off the points that tear the paper until the pressure comes equally on all the molars and bicuspids.

It is not sufficient that the paper be torn merely, but it must be torn by every tooth so nearly alike as not to show by which it is torn the most easily, for it matters but little how nearly together all the rest of the teeth come, if one tooth is but a hair's breadth longer than the others, all the pressure that should be distributed among fourteen teeth must be sustained by that one; and when one tooth is made to perform all the work that should be borne equally by fourteen, either that tooth or the plate must break, and to this cause may be traced a large per cent. of the breakage of artificial work. Nor is this all. If the teeth strike harder on one side than the other, the opposite side will tilt just in pro-

portion to the unequal pressure, and no matter how trifling this may be, it will admit enough air under the plate to keep it constantly loose.

In the natural teeth not only every tooth but every portion of the grinding surface of a molar comes in contact with every portion of the grinding surface of its antagonist, and we should imitate this example. It must here be evident to the reader that the better the articulation at first, the better will be the final results; for there never should be so much ground off of a set of teeth as to mar their appearance, nor to make them so smooth as to injure them for mastication. Some dentists try to articulate a set of teeth by using the paper as I have described, while the teeth are in the mouth, but the difficulties attending this plan are so numerous, and the results so uncertain, that I can see but little if any advantage to be derived from it. Having completed the articulation of the molars and bicuspids, place the work again in the mouth and proceed to articulate the six front teeth. The offices of these teeth are entirely different from the former, and for the articulation of these it is necessary to have them in the mouth that we may this time have all the different movements of the jaws. When a full set of teeth is properly articulated so that the molars and bicuspids will catch the paper as described, there should be just enough space between the front teeth, upper and lower, for the paper to be drawn through freely without being torn, the superior slightly overlapping the inferior, but when the under jaw is extended forward so as to bring the front teeth squarely together, then these teeth should be articulated so that every tooth shall come in contact with its antagonist. In the natural teeth, as a general rule, not more than one or two of the front teeth come in contact with the teeth of the opposite jaw at the same time, but by close inspection it will be found that by the different motions of the jaws every tooth is brought in contact with its antagonist, and made to perform a part of the work. When the cutting edges of the front teeth are brought square together, the back teeth do not touch, and the paper can be drawn freely between them. They are two sets of organs whose work is entirely different. The front teeth cut the food and the molars grind it. When the jaws are at rest, the teeth do not remain in contact, but are separated about a sixteenth of an inch, and in preparing an artificial set this should be taken into consideration and the proper allowance made, or they may be too long, and in such case they would be heard striking together in conversation. In the continuous gum work of Dr. Allen the slightest defect of this nature is readily detected, and the whole blame attributed to the peculiarity of that style of work, whereas the teeth made on rubber may strike just as hard while talking, and yet the sound be scarcely perceptible. The blame could not justly be attributed to any style of work, but to the defects in doing the work. Embraced in the subject of the articulation of the teeth are frequently met certain cases of a very difficult nature. Take for

instance one of those limber-jawed persons, if I may be allowed the expression, where the muscles are so lax that they permit the lower jaw to move about so that it seems to have no fixed place of abode. Direct such a person to bite, and the lower jaw will be very likely half an inch too far forward. If you push it back till the condyles press properly into the glenoid cavities, it may be a quarter of an inch too far back, so that in taking the bite if you hold the chin in the palm of the hand and press back as the patient closes the jaws, you have taken the bite too far back. The remedy I propose is this. No matter how conspicuous the defect may be, let the teeth be worn a day or two, if circumstances will permit, till the lower jaw assumes its natural position, and enjoin upon the patient not to permit the work to be inspected or criticised till you pronounce it finished. After compliance with these requirements, entertain your patient on some subject foreign to the teeth, for it is a fact that while you direct the mind of a person to the teeth, and an effort is made to close them in a certain position, they will be almost certain to be closed wrong or in the opposite direction. When a person is in the act of swallowing, the teeth always come in contact, and by taking advantage of this circumstance, and requesting them to be held firmly together at this time, you may plaster them together and remove from the mouth and secure them in the articulator as in other cases. Such teeth as are wrong may now be removed from the plate and rearranged if necessary on a new plate. This guide is unerring, for in whatever position you find the teeth when a person swallows will always be right. In regard to full upper or under or partial sets, of course they must be articulated in the mouth, and in doing this I always use the strips of paper and a strong magnifying glass. It is much easier to manage an upper or partial than a full set, and by having the teeth held pretty firmly together and keeping the lips out of the way, any defect, by the aid of the paper and the glass, may be corrected, always being careful that the pressure does not come on the front teeth at the same time that it does on the back ones, except in those rare cases of protrusion of the lower jaw where the teeth come squarely together all round.

USES OF THE MICROSCOPE.

BY J. S. LATIMER, D.D.S.

In the study of Natural History the microscope is an invaluable adjunct, and its revelations of the details of plants and animals, and especially of the minuter forms of life, are indeed astonishing. Up to the days of Trembly, the Hydra had been classed among the plants, but the microscope revealed the fact that it is a true animal and a most wonderful animal, too. "It was ascertained that it could propagate itself by buds like a plant; that it could produce afresh any part that might be cut away;

that if cut across the upper part, it would produce a new body and tail, and the lower part as rapidly produce arms and head; that if the head was divided, each portion would provide for itself the wanting part; that if minced into thirty or forty pieces, each piece would grow into a new and perfect polype, and that if two individuals were *grafted* together, head to head or tail to tail, or the head of one to the tail of another, still the animal economy would be as complete as ever: ay, more wonderful than all, it was found that this extraordinary creature could endure to be turned inside out like a glove, so that what had been outer skin should become stomach, and the lining of the stomach become outer covering or skin; while, from all this dissecting, grafting, and transforming, the animal itself seemed to suffer not the slightest inconvenience, being apparently blessed with exemption from everything like bilious attacks or stomach complaints in that department of the body from which so many of man's ailments arise!"

Among the revelations of the microscope, few are more interesting than those concerning the diatomaceæ, those wonderful plants without roots, which make their way through the water by some means still not understood, and which seem endowed, at least, with volition. Their species and forms are almost innumerable, and their contour and markings of wonderful symmetry and beauty astonish the beholder with their geometric accuracy. They abound in all water, whether salt or fresh. Their silicious coverings endure for thousands of years in the bottoms of oceans, lakes, and rivers, where these fragile shells remain undisturbed by the restless waters above them. In such places they accumulate to the depth of several feet, when, by some convulsion of the earth, large tracts of ocean-bottom are elevated and subsequently become inhabited. Thus the City of Richmond, in Virginia, is built on a bed of fossil diatomes, and the same may be said of the City of Berlin, Prussia. The Tripoli polishing-powder consists mainly of the shells of diatomaceæ. "The nummulitic limestone, forming a band often 1800 miles in breadth, frequently of enormous thickness, which stretches from the western shores of Europe and Africa to India and China, and also covers vast areas of North America, is found to consist chiefly of microscopic remains."

With the instrument which the Brooklyn Society has lately procured, the diatomaceæ are very well shown.

Among the most interesting forms of animal life, are the animalculæ found in all stagnant water. Of these, the rotifera or wheel animalcules are especially worthy our attention. "The Rotifer is not the $\frac{1}{36}$ of an inch long; it possesses tail and eyes, chin and mouth, jaws, teeth, and stomach." "The name Rotifer was given them because of their having in the anterior parts of their bodies little organs like wheels, and which the animal revolves upon their own axes. This appearance is as extraordinary as if the head of a man were seen to be continually whirling round on the axis of his neck."

I have enjoyed the pleasure of studying the habits of these creatures in their native fastness, which fastness was a drop of water in which were hundreds of living creatures pursuing and pursued. It is extremely interesting to observe the working of their hearts, jaws, wheels, and other organs, which, from their size and translucency, are easily visible.

By the aid of the microscope, many otherwise unaccountable phenomena in nature are explained. For instance: "The dust-shower at Lyons in 1846, where an immense mass of matter must have fallen, weighing 72 cwt.; the occurrence of *red mist* and then a descent of blood-rain at Locanno, near Lago Maggiore in 1775, leaving a red deposit, which must have covered forty German miles square; and a shower of dust which fell upon the deck of a vessel in the Atlantic Ocean, about 500 miles from the west coast of Africa." In all these cases the microscope proved these phenomena to be due to the existence in the atmosphere of minute organisms which were thus precipitated upon the earth. And the same instrument accounts for the red snow which is occasionally showered upon the earth; indeed, "Ehrenberg has investigated this whole subject very carefully, and records the occurrence of no less than 340 showers of blood-rain and dust-rain," once the cause of great consternation among the ignorant and superstitious, but now known to be caused by the presence of minute plants too small to be made out with the unaided vision.

DENTITION; ITS PATHOLOGICAL AND THERAPEUTIC INDICATIONS.

BY GEO. W. ELLIS, M.D., D.D.S.,

LATE PROFESSOR OF DENTAL PHYSIOLOGY AND OPERATIVE DENTISTRY IN THE PHILADELPHIA DENTAL COLLEGE.

(Continued from page 573.)

By some rickets is believed to be intimately connected with strumous vitiation, while others, and perhaps the majority, regard it as in no way connected with scrofula, but a separate and distinct disease, possessed of its own peculiarities.

What its exciting cause may be is yet undetermined, but the indications of its existence are observed in the bones which fail to receive their proper share of calcifying elements, and consequently exhibit at a late period the pliant properties characteristic of the cartilaginous stage; from this fact the osseous system is wonderfully deformed by trifling mechanical causes, and we have as the result lamentable contortion of the femur, vertebral column, chest, pelvis, etc.

In all this malnutrition the hard and soft parts necessarily sympathize, and we notice in bad cases but few tissues unimpaired, the muscles, blood-vessels, nerves, and teeth all suspend the developmental progress and fail to attain perfection through absolute inanition.

Rickets is emphatically an infantile disease, and Guérin found, out of 346 cases, 277 were in children under two years of age; occurring thus before the completion of the teeth, it may interfere very seriously with the proper proportional development between the jaws and those organs, thus occasioning difficult dentition.

Chemical investigations have determined the fact that rachitical bone is markedly deficient in the earthy salts, and the inference that the disease is due to either an insufficient introduction, impaired assimilation, or excessive elimination of the phosphates.

When, however, we are aware that our food is plentiful in these salts, and that even in rachitic subjects they are freely excreted from the system, it seems rational to attribute the difficulty more to an appropriative inability than to a deficiency of supply. Dr. Jacobi says: "Altered condition of food, particularly want of proteinates, and disorders in one or more of the important digestive organs, at a period of life in which the organism requires much and appropriate new material, are the prominent first causes of rachitis."

It was for many years the accepted practice to exhibit in these cases the phosphate of lime; it had, however, fallen into disuse until attention was again directed to it by Dr. Beneke, a German physician, who advocated its employment "upon the ground that, as it is essential in the formation of cells, it is likely to prove useful where there is a deficiency in cell-growth;" nevertheless it is believed by many capable of judging, that the benefits attributed to *it* arose in a great measure from cod-liver oil, in connection with which it is most frequently administered.

The treatment of this affection is as yet but very imperfectly understood, and consists chiefly in the strict enforcement of hygienic measures, together with the exhibition of tonic remedies, of which iron and the various preparations of quinine constitute the chief.

Here, as in struma, the milk of the mother must be examined, and if found deficient in any of the qualities which are essential to the proper nourishment of the child, should be discontinued, and replaced by the milk of a healthy wet-nurse, or, if this be objectionable or unattainable, by ass's, goat's, or cow's milk.

From the examination of the milk of several women whose children were rachitical, Friedleben discovered a great deficiency of protein, the hydrates of carbon, and the earthy salts; yet the latter were fewest in the cases where the disease was least strongly pronounced, which has been deduced as proof against that view which finds in the diminished import of the phosphates the primary cause of trouble. Says Dr. Jacobi: "The largely diminished amount of phosphates introduced into the system (not only into the stomach), which is the result of the rachitical process, well explains the slowness with which the teeth form and protrude in rachitical children, and the simultaneous retardation of walking and the slow ossification of bones generally."

Let us now take cognizance of another form of cachexia, which is much more prevalent than the last mentioned and equally prejudicial in perverting the normal trains of dental development, viz., marsh or malarious cachexia.

It is yet undecided as to what agent is attributable the production of miasmatic fevers; and although for many years the paludal theory has been almost universally accepted as most satisfactorily explaining the various phenomena of those affections, the influence of electrical disturbances of the atmosphere is now becoming recognized as strongly favoring such pathological conditions.

No doubt we are all, or at least most of us, familiar with the usually accredited causes of "fever and ague," yet it may not prove unprofitable to notice a few of their leading features in this connection.

The doctrines advanced in our standard works upon the "Theory and Practice of Medicine" teach us to look for the existence of three favoring causes, viz., heat, moisture, and vegetable decomposition, and regard the existence of intermittent or remittent fevers always traceable to the presence of an infectious emanation.

A temperature of 60° F. is deemed essential to the development of miasmata, at 80° its prevalency is increased, and its march checked by the occurrence of frost; yet notwithstanding these general leading features, there are variations either in the degree or duration of one or the other of these causes which wonderfully modify the intensity of the poison so called; thus, not only intense heat but a certain continuance of it is necessary; although moisture is one of the requisites, an excess acts as a preventive, as for instance during heavy rains the morbid influence is less marked than after the evaporation or drainage of the water; and while its virulence is generally in proportion to the amount of vegetable matter decomposed under these influences, we occasionally observe it in districts proverbially dry and almost destitute of vegetation.

The intervention of high hills, dense foliage, or a body of water between an adjoining locality and the source of disease has been observed to act as a barrier to its progress, leading to the belief that the two latter act as solvents of the effluvia, while, from its specific gravity, occupying positions near the surface of the earth, mountains present mechanical obstacles which it can neither leap nor penetrate. From a close observance of all its peculiar manifestations and the detection of organic matter in the air of marshes by chemical reaction, a theory regarded as explanatory of its nature has been adopted, as follows: that the poisonous effects of marsh air is due either to the presence of animalcules or the existence of microscopic fungi, which are supposed to find in vegetable putrefaction conditions favoring their development, and, entering the system, to start a train of pathological phenomena which we designate "fever and ague."

This theory, though quite universally accepted, is unsubstantiated by proof, and can establish no stronger claim to adoption than the explanation which attributes the *exciting cause* of epidemics called *malaria*, not to "bad air," as the name implies, but to disturbed electricity, causing a want of electrical equilibrium in human bodies.

This latter theory, promulgated by Sir Jas. Murray, M.D., is deserving of the greatest consideration from the authority from whence it emanates and the plausible arguments offered in its support, and I am sorry that our subject does not permit its fuller consideration; suffice it to observe, however, that numerous experiments have been tried to protect the bodies of residents in infected districts from the sudden and depressing electrical variations, and the trials have proven that houses carefully insulated are comparatively healthy in all locations.

Be the influence what it may, we are apprised of its presence by the occurrence of certain constitutional signs and symptoms which, together, are termed intermittent or remittent fever, according to the completeness or imperfection of the intervals between the paroxysms.

It is hardly necessary to enter into a close description of the peculiarities of either as to why they are termed quotidian, tertian, quartan, the regularity of the cold, hot, and sweating stages, or the almost entire absence of one or more of these constituting the form vulgarly termed "dumb ague;" but *it is* advisable to consider its remote effects, together with the treatment adopted, in order that recognizing it by its peripheral indications, we may select and apply appropriate remedies.

SENSITIVE DENTINE.

BY HENRY S. CHASE, M.D., D.D.S., IOWA CITY, IA.

For many years past I have never neglected to read every article on the above subject which I could find. I have tried all the remedies recommended with unsatisfactory results. Every reader of the Dental Cosmos will peruse this article, and I am glad of it, for I have something valuable to communicate.

Sulphate of morphia is the remedy that I have been using for ten days past, and it has disappointed me in not a single instance. It must be brought into *contact* with the *sensitive* dentine or it will not produce its effect, which is *anæsthesia.*

If a cavity is sensitive in several parts and the morphia is brought into contact with only a portion of the sensitive dentine, then pain will be felt in that portion which did not meet the morphia.

I do not know yet in what manner this may be most effectually done, but so far I have moistened the crystals with water, and taken up as

much as possible in a pledget of cotton wool, and after introducing it into the cavity, have placed lightly over it a plug of cotton wet with sandarac varnish. Let me tell you how I came to use morphia. I had been reading an account of local anæsthesia produced by subcutaneous injections of morphia. The same day a patient presented herself for plugging several teeth. The first which I attempted to excavate was the left under second bicuspid. I found it so sensitive that the patient declared she *could not* bear it. The cavity was on the grinding surface, and deep, extending two thirds the length of the crown. I syringed the food out with tepid water, and found that *every* portion of the cavity was sensitive. The thought immediately occurred to me that I should *try* sulphate of morphia. I *filled* the cavity with it and placed over all a small plug of cotton wet with sandarac varnish. I told the lady that it should remain one hour, and I would in the mean while prepare some other cavities. The next cavity was so little sensitive that I did not use morphia. The third one was very sensitive, and I used morphia, which remained ten minutes only. No pain was felt in excavating this except in an upper corner next the enamel at the entrance of the cavity. The fourth tooth was also sensitive, and I used the morphia, which was retained *fifteen* minutes. This gave no pain in excavating.

I had prepared these cavities without plugging, intending to plug them when *all* were prepared. The hour had expired which I had allowed to the first tooth which was so exquisitely sensitive in every part, and I now removed the morphine plug. There was no feeling of pain in probing any portion of the cavity. I used my excavators in an energetic manner, *bearing on* and cutting as deeply as I could, for I wished to *test* this case. Every part of the cavity was thoroughly scraped, and *no pain* whatever felt. I was overjoyed, and thought of sitting down immediately and sending the DENTAL COSMOS an account of it. It was too "good a thing" for me to keep. Thank God I never had a secret in dentistry, and never intend to have. I feel that I shall never be able to do as much for my profession as it has done for me; I am its debtor still. I concluded to try it in a few more cases before I made the discovery known, which I have now done, and in every instance with the greatest satisfaction.

Let me relate one more *case*. Mrs. P., aged forty, had a large cavity in the anterior approximal surface of the right upper third molar; the second molar in its place. The cavity extended under the gum. The decay was of the white variety, deep, and had not been washed out of the cavity to any extent. I commenced removing the softened dentine, when she forbid me from proceeding, declaring that she had rather have the tooth extracted. I prevailed on her to allow me to take out just a little of the decay so that there would be a cavity to *hold* the morphia.

I now put in the morphia on some cotton, and endeavored to have it touch every portion of the cavity. I then used some cotton and sandarac, placing it *between* the teeth, as the cavity was full; being nearly night, I removed the morphia in exactly fifteen minutes, not expecting full anæsthesia, but was agreeably disappointed in finding that severe and rapid cutting produced no pain.

I must say that I am astonished with these results. The theory of dentinal nerve fibrils I will not now discuss. But it does very much look as though dentinal nerve fibrils were narcotized in these operations. That, in fact, is my belief, and a belief in the existence of these fibrils led me to make these experiments. I expect that thousands of dentists will test this remedy immediately, and the DENTAL COSMOS will undoubtedly hear from some of them.

It will be found most successful in brown or hard decay, by allowing the morphia to remain an hour or longer. The soft decay will receive it with the most facility, and requires the shortest time. Patients should not leave the office without the morphia being well secured against coming out, as it might in mastication, or in the night, and serious results follow if swallowed. This is more particularly the case with children, as they are more easily affected with morphia than adults. One-fourth of a grain of morphia is a narcotic dose for an adult, which would probably do no harm if swallowed; but it is better to be very careful. I use from one-eighth of a grain to a whole grain in a cavity, according to size. I shall try mixing the morphia intimately with beeswax, and using *that* instead of cotton. Let every one find out by experiment the *best* way to use it. I should have delayed publishing this remedy until I had made more experiments, had I not felt an earnest desire to have the profession and public benefited as soon as possible by its immediate use.

TO REMOVE TEETH FROM VULCANITE PLATE.

BY W. H MARVIN, SWANTON, VT.

I HAVE noticed in the June, December, and February numbers of the DENTAL COSMOS, different methods of removing teeth from vulcanite plates. The method I practice I consider superior to them all, being practicable at any season, quicker of accomplishment, and more simple: viz., hold that portion of the plate where you wish first to commence removing, over the flame of a spirit lamp; in a few moments the rubber will soften enough to cut away with a sharp knife, and remove the teeth in that vicinity, so on to the next till all are removed. If ordinary care in removing is taken, no teeth need be broken. I can see no advantage over this method of making fires in stoves in warm weather to heat the plates, going to the trouble of heating sand, or using oil.

TREATING DISCOLORED TEETH.

BY CHAS. L. HOUGHTON, D.D.S., POUGHKEEPSIE.

I OBSERVE in the April number of the DENTAL COSMOS, that chloride of lime, chlorate of potash, etc. are recommended for the bleaching of discolored teeth. I have used these preparations with some success; but of late have been using chloride of lime in connection with os artificiel, and find it works better than I anticipated when first conceiving the idea. The proportions used are about equal parts of the lime with os artificiel mixed with the liquid; the combination throws off a large quantity of chlorine, and chlorine is the active agent that bleaches. This may not be new to the profession, but I offer it for what it is worth.

I find the os artificiel very beneficial in filling over *exposed pulps.* This may appear incredible to many, but I have tried it in a large number of cases where the patients could not wait for the pulps to be destroyed and extracted, *and have never had a case* to trouble the patient in any way, except the slight pain when first introducing the filling, which seldom lasts longer than from fifteen minutes to one hour.

PREVENTING PLASTER CASTS ADHERING TO THE RUBBER AFTER VULCANIZING.

BY JAIRUS S. HURLBERT, D.D.S., SPRINGFIELD.

PERHAPS I may be able to serve the mechanical operator by informing him, through the pages of the DENTAL COSMOS, of my modus operandi for preventing plaster casts from adhering to the rubber after vulcanizing.

Cover the casts with tin foil, pressing it down smoothly in all the depressions, and then joint the whole with liquid silex; after vulcanizing, the tin foil will clean off readily, leaving the plate in pleasant condition for the mouth. This plan is only feasible where dry heat is used in packing.

SURGICAL DEPARTMENT OF THE PHILADELPHIA DENTAL COLLEGE.

Under the charge of James E. Garretson, M.D., D.D.S.

CLINIC REPORT.

BY H. L. GILMOUR, D.D.S.

Recurrent Epulo-Fibrous Tumor.—I have the misfortune, gentlemen, to present, as the first lesson of to-day, a case which has made me feel sad for the past twenty-four hours. You remember this patient, upon whom I operated some three or four weeks back, making a resection of the lower jaw, for what I pronounced to be an epulo-fibrous tu-

mor. You will recollect that this tumor appeared to have its origin from the periosteum, at the back part of the cuspid tooth, and as we watched it, we saw it increasing in size until at the day of operation it was quite as large as the ordinary Lima bean. I told you it was a benign growth, but I made a reservation, reminding you that, in the lectures on the sarcomatous growths which I had the pleasure to address to you, I made a strong point of the fact that sarcoma and carcinoma were, as relations, close knit in the bonds of a common fellowship and sympathy, and that it was a common nature of blood that flowed in them. That, like all relations in common blood, one was not to be disappointed if, in the apparent angel of the family, occasionally was to be found outcropping the malignancy of its apostate,—and that, on the same grounds of inference, any and every intermediate condition might be recognized as capable of having an existence. You will recall that, in the extirpation of this tumor, I was so desirous to be outside of any local relations it might have, that I bounded the section in front by the alveolus of the central incisor tooth, posteriorly by the alveolus of the second bicuspid, and below by the greatest depth of the alveolar process. This, I told you, was a proper mode of extirpation; that it was a necessity to be well to the outside of all such growths. But here, to-day, is the tumor recurring; and not with the simple, harmless face with which we first saw it, but starting up threateningly in lobules, like so many armed dragon-teeth.

Did I fall into an error? Did I mistake the apostate himself for the angel? I did not; and I believe I will cure this lady yet, without a section that shall deform her. I had proposed to operate upon her again to-day, but must defer it to another time. She is too much depressed from the nervous disquiet induced from understanding that another and perhaps a third operation will be necessary. But I may tell you, as I have told her, what I propose to do. I have seen so many fibro-recurring tumors in the mouth, that while I dread them, yet I have learned not to be unnecessarily frightened by them. Now, if I had in my own person the experience of this lady, I would not, without another trial, suffer a complete resection of the bone. This deforms one for life; and if such resection is not an absolute proven necessity, then to make it would be barbarity. You may suggest that a common experience may prove a common order of cases, and this would be very unobjectionable logic. But experience does not prove that the epulo-fibro recurring growths are not conquerable without complete resection; at least my experience does not so prove; and as I have seen, and have done much of this surgery, I think the experience is entitled—from myself at least—to some share of consideration. I propose, at a proper time, to make a second section in this case. My anterior cut shall be made directly in the symphysis, and shall extend within two lines or thereabouts of the

base of the bone; the posterior incision shall be somewhere in the neighborhood of the position of the second molar, and shall be to a like depth. These cuts are to be made with the saw, and not with cutting forceps, as used in the first operation. We are to deal now with the solid body of the bone: and the lower jaw is, as you well know, too solid and close in texture, in most cases, to admit of the vertical forcep-cuts, without great danger of fracture. The connection of these two cuts removes, as you see, all the intermediate body of the bone, leaving only a delicate rim or arch of continuity. If, with the removal, the disease is obliterated, there is no interference either with the harmony of expression or the office of the parts that cannot be easily enough restored with a few artificial teeth.

Suppose, however, that the trouble again recurs, what must be done? We must make, then, a complete section of the bone; and the extent of this section will be influenced entirely by the character of the reappearing growth. We may take away the rim or arch left; or the only hope of cure may be seen to lie in the entire removal of the bone—that is, removing it at the articulation.

In the mean time I propose to try upon this case the effect of persulphate of iron. I have told you that with some it has quite a growing reputation in the treatment of conditions carcinomatous in type. Watching the tumor closely, I will daily subcutaneously inject a few drops of Monsell's solution; I will also daily compress the part. This is easily done by moulding over it a piece of gutta-percha, upon which the superior teeth can act.

Under this compress I will lay one or two thicknesses of cotton stuff; this also shall be medicated in the solution of iron. I do not know, gentlemen, personally, anything about this anticarcinomatous action of iron. I have never tried it. It is claimed to be possessed of specific action, and I trust that the claim will be proven to be well founded. It is, however, I may suggest, a somewhat delicate matter to try experiments in combating outgrowths. You know the common talk about handling cancers; it is not talk alone, I can assure you. As this lady is, however, prepared to undergo an operation at any hour demanded, we may feel that we can do her no harm in attempting to cure without the knife. Try new things with caution.

A very good rule of conduct is:

> "Be not the first by whom the new is tried,
> Nor yet the last to lay the old aside."

I would not advise you not to try new things, nor would I deter you from seeking in all channels for good; but let all things be tried, and all new things be sought on the foundation of an educated judgment. Quacks stumble on good remedies, and an ass, slipping on the mountain

side, may turn up a nugget of gold. As we do not object to appropriate the gold, we should not hesitate to take to our use the remedy.

This application of the persulphate of iron is not, however, the stumble of a quack. There is reason in its employment, and we will carefully test it, hoping that the premises are well founded.

I will show you the patient at our next clinic, or as soon as an opportunity offers.

PROCEEDINGS OF DENTAL SOCIETIES.

REPORT OF THE DISCUSSIONS OF THE SOCIETY OF DENTAL SURGEONS OF THE CITY OF NEW YORK.

BY J. S. LATIMER, D.D.S.

At the meeting of January 16th, Frank Abbott presented a second edition of his set of instruments, and explained their special uses.

[As Mr. White's catalogues will soon be out, and will probably contain cuts of these instruments, I have deemed it best not to occupy space with verbal descriptions, which are always inferior to good cuts.—J. S. L.]

C. B. Grout exhibited a syringe for injecting fistulæ.

Dr. Atkinson said the time was when dentists kept their improvements, whether in instruments, methods, or remedies, entirely to themselves, but happily that time is past, and we now see men hastening to share their good ideas with their brethren.

With reference to instruments, he would say that he believed the ovoid point comes nearest his ideal for packing gold. It not only condenses the gold on a line with the force, but presses it out laterally. He arrived at this conclusion from using an ovoid bur at a time when the right-shaped plugger was not at hand.

He objected to fish-tail pluggers with straight edges, preferring to have the edge rounded both ways. The sets called by his name contain many that neither he nor anybody else can use satisfactorily. He deprecated separating teeth with rubber because of the danger of periodental inflammation, elongation of the tooth and death of the pulp. An eminent dentist of the West has done more harm than a little by this method of separating.

We must have plenty of room and full control of the patient. Many a tooth is half filled or even removed rather than have inserted a contour filling which might be conspicuous in the mouth of the patient. This sort of taste he believed to be defective, and, certainly, destructive, hence we should labor to replace it by a healthier and more sensible taste. Concerning those who object to welded fillings, he believed their objections unfounded, and their practice likely to preserve a far smaller proportion of teeth.

J. S. Latimer thought the tendency of the ovoid plugger would be to condense the gold directly beneath the centre of the instrument quite thoroughly, while at either side of the centre the condensation would be less and less. This difficulty could be overcome only by going twice over each piece of gold, a practice pretty generally deprecated by good operators, as it breaks down the prominences left by the serrations.

Dr. Fitch objected to instruments with acute angles near the points, as they are liable to break weak walls.

He said he had seen a filling made under the saliva with Lamm's gold by Dr. Arrington. It finished up well, but he would not risk wet gold of any preparation, for building out a tooth.

Dr. Arrington, being called for, said he could fill any cavity, wet or dry, with Lamm's gold. He thought gentlemen trying it would be pleased with its working qualities. It is a precipitate.

In his own practice he would use it in half the cases. He had lately seen the rubber-dam used, and believed a preparation of gold capable of being welded when moist is less essential than formerly.

January 30th. Subjects,—"Leaving Softened Dentine Over Nearly Exposed Pulps" and "Retaining Points."

J. S. Latimer frequently leaves softened dentine rather than risk exposure of the pulp by its removal. He dries and saturates it with creasote before filling. If the walls are of good material, he has no fears of decay progressing in the bottom of the cavity. In all such cases a film of gutta-percha or other non-conductor, covered, if necessary, by a protecting cap of gold plate, is employed to prevent death of the pulp in consequence of thermal shocks or pressure. He makes retaining points with ordinary drills for the retention of the first portions of gold, as any subsequent motion in that is generally fatal to entire success. These may be enlarged on two opposite sides of their orifices, as they are thereby greatly strengthened. He had, for two or three years, preferred crystal gold for filling the retaining points, but generally completed the filling with foil, annealed at the moment of its application, after having connected the fillings in the retaining points.

Dr. Atkinson had seen the time when he would have given six months' labor for knowledge which the gentlemen in this room can now impart in two hours. The question substantially is, How can we keep plugs in?

He would connect the drill-points with a furrow, at the point of commencement, and, if the walls of a tooth had too little strength, he did not hesitate to file them down and build the gold over the edges so as to strengthen and protect them. He bevels the edges. Prefers foil to crystal for packing into retaining points, deeming it stronger. He would not uncover a healthy pulp, but, if there was any aberration from health, would treat, and then fill, but not on the day of excavation. He had seen softened and partially decalcified dentine become hard. Would treat an

aching tooth with creasote, if the pulp was inflamed. Covers and protects the softened dentine over nearly exposed pulps, with caps of gold or platinum.

J. C. Robbins had employed the oxy-chloride of zinc for capping exposed pulps, and with the happiest effect. He now has in his mouth a tooth, which, he believes, contains a living pulp, but which had the pulp fully exposed five and a half years ago. The cavity was excavated and filled with the zinc preparation, which remained some three years. The cavity was then excavated more thoroughly (during which it gave unmistakable evidence of being alive) and filled with gold, since which it has remained comfortable.

Dr. Fitch said the anchorages are often made in a slovenly manner. He invariably anchors with pits and slots or grooves. He would like to know whether the gentlemen generally deem such anchorages essential. If the first portions of gold are not so anchored, the filling will be liable to be moved during the process of its introduction, in which case it should invariably be removed, as it is hardly possible to make it entirely exclude fluids without this precaution. Prefers foil for filling the retaining points. Does not like to fill over softened dentine, and where the pulp is once quite exposed he thought it generally died, though there might, in many instances, be no very palpable notification of its demise. When he does fill over a nearly exposed pulp, he caps with a concave gold cap.

J. C. Robbins did not think best to drill retaining points in every cavity. He had exposed the pulp, before now, in efforts to make such points.

In saucer-shaped cavities, he required them, but when the general contour of the cavity will retain the filling, he holds the gold in position with an instrument in his left hand until it is built across to the opposite wall and secured against motion.

John Allen, D.D.S., thought best to make the retaining points in all cases where danger of exposure of the pulp was not imminent. With our present facilities for keeping cavities dry, and welding the gold into unitary masses, we need rarely fail if we will attend to the precaution of anchoring the initial portions of the filling as described by Dr. Fitch and others.

C. E. Latimer, D.D.S., made retaining pits for the first portions of gold. If we hold the filling in situ with an instrument as described by one of the speakers, there might still be a small and imperceptible motion of the mass which will make the adaptation to the walls imperfect; hence the anchorage by pits is safer, while we still make the general shape of the cavity do as effective duty as in the other method. He employed small points for filling the retaining pits and malleted the gold well in. For retaining fillings in cavities compounded of approximal and grinding surfaces, he makes that portion of the filling on the grinding surface serve to assist largely in the retention by making it somewhat on

the plan of the dove-tail, larger near the centre of the grinding surface than it is at the approximo-grinding angle. In cases of cavities on both approximal surfaces, he often builds over the grinding surface a strong connecting band which serves to hold both fillings in place.

He yesterday filled a superior bicuspid having a cavity compounded of the anterior approximal and grinding surfaces. The lateral walls were frail, and offered no chance for retaining points. He filled the pulp cavity with gold, and then drilled a hole in it, into which he drove firmly a platinum wire, around this wire he built his filling.

Dr. Atkinson said he was on record for saying that gold foil, properly annealed and packed, is stronger than any frail wall. He would never hesitate to cut retaining points in weak teeth, but he would build the gold around the edge of the wall so as to strengthen it. In case of the cavities mentioned, compounded of the approximal and grinding surfaces, he would form a dove-tailed mortise on the grinding surface by the aid of a flat separating file. If the walls were frail he would dress them down with a file, bevel the edge on the external surface, and build the gold so as to inclose and support the walls. Concerning the files, he would say they are made too coarse.

W. B. Hurd, D.D.S., thought there was too much of a tendency to cut the teeth away unnecessarily, and to display gold. He did not think such a display in accordance with good taste. He did not believe gold, as built into and on to the teeth, stronger than tooth-substance. If any man said he never had his fillings fail, he had little confidence in that man's honesty.

Dr. Fitch had removed the pulps of teeth when no hard dentine protected them. He would not, however, object to leaving softened dentine over healthy pulps when the septum is strong and thick enough to protect them. Within two weeks he had cut a pulp. He applied creasote and asbestos, over which he placed a gold cap and a filling. He had heard nothing unfavorable of the case, and he hoped much now, because he believed that if trouble was to follow, it would have come before this. If the symptoms remain favorable, he would soon fill permanently.

J. S. Latimer had recently capped a few teeth with pulps exposed, with a view of learning what may be done for their preservation. He described one or two cases in which he applied cotton or paper, slightly moistened with creasote, next to the pulp, and filled over it with oxy-chloride of zinc. He had heard no complaint of the cases since the experiments were instituted, and he hoped they might result satisfactorily.

He recently had a little girl in his chair for whom his friend, Dr. W. A. Bronson, some three years ago filled over an exposed pulp with Hill's or Bevin's stopping, interposing cotton between it and the pulp. The vitality was very apparent. The teeth were poorly organized. He capped with paper slightly wet with creasote, and filled with amalgam.

He remembered one case which behaved kindly for six months, and then brought the patient back to him with a swollen face. Mentioned a case which had been described to him by a lady patient, of a gentleman by the name of Holmes, resident in one of the Carolinas, who, though then an old man, never had any teeth, and was too well satisfied with his edentulous jaws to accept the services of a dentist.

O. A. Jarvis had been fortunate in saving pulps alive. He dries the cavity thoroughly, and examines the exudation to learn its character. He objected to capping with cotton because he believed it would decompose, on which account he prefers tin for capping.

TRANSACTIONS OF THE BROOKLYN DENTAL ASSOCIATION.

BY W. C. HORNE, NEW YORK.

May 15, 1867.

THE CLEANING OF TEETH.

Dr. Horne said that cleaning the teeth, and teaching his patients to keep them so, is a professional duty none the less important because it is greatly neglected. We may fill our patients' teeth ever so well, but if they (untaught by us) suffer the causes of former decay to proceed without check, we may look soon to do our work over again. Such a result cannot be pleasing to any one having a proper regard for the responsibilities of his position.

The first thing to be done to a set of teeth presented for the dentist's inspection and care is to free them from stains, tartar, or any foreign matter. Let the patient do what he can of this, there will commonly remain much which requires all the operator's skill to remove. A strong argument in favor of this cause, if any is needed, may be found in the opportunity thus afforded of accurately locating all the points of decay, and by indicating them on a suitable chart the patient is assured against their being overlooked. Having done all that the wisdom of our many teachers suggests, our work is worth little unless the teeth receive constant care from their possessors. Surely no one is so squeamish as to hesitate to give full directions on this subject, and to repeat them as often as may be needed; at the same time supplying suitable brushes, toothpicks, silk, powder, and gum wash when necessary, leaving no doubt of the need of their frequent and regular use.

The accumulation of tartar is an evil which no words need be wasted in denouncing; every dentist knows how it insinuates itself between the root and its surrounding membrane, occasioning no pain, and therefore not attracting from the individual the attention it requires, until it has loosened the tooth and permanently impaired its usefulness. In removing tartar great care should be taken to leave no portions below the gums,

as well as to scale off what is plainly in sight. Dr. Atkinson has some instruments which he will exhibit to-night for effecting this object, to which they are admirably adapted. After the scalers have been used, the roughened surfaces should be gone over with pumice-stone on a stick of orange-wood, leaving nothing to invite an immediate lodgment of fresh deposits. Stains upon the teeth may be removed by polishing with a slab of some fine-grained stone, to be kept wet while in use. Dilute acids are used and commended by some, followed immediately, tooth by tooth, with an alkali; but this is a dangerous practice.

One word about brushes. These should not be very large, nor very hard, but of such a size as to pass readily between the cheeks and the teeth, and soft enough to insure their being used freely about the gums; but the brush will not remove particles between the teeth, and here the toothpick comes into play, made of a quill, or of some soft wood, to be used invariably after eating.

Tooth powders enable the brush more readily to free the teeth from the mucus with which they may be covered; they are in many cases indispensable. Soaps may be used when the teeth and gums are very sensitive, and where there is not a disposition to collect tartar. What is good in one case, of course may not do in another. We must discriminate, and use whatever methods prove best to keep the teeth as near absolute cleanness as possible.

Dr. Atkinson said that of all the operations miserably botched, that of cleaning teeth bore the palm for being execrably and atrociously bungled. There seemed to be no conception on the part of the mass of dentists as to what cleaning teeth implied; a little scratching and scraping satisfied them, and the patient is sent off in worse condition than he was before. They plead that it don't pay to spend time over cleaning the teeth; but that excuse only proves that they themselves have no idea of the importance of what they are about. No teeth that need cleaning at all can be cleaned at one sitting; each individual tooth should be cared for separately, and no other attended to until the first is fully restored to its normal beauty. Give all the time to the case it demands for reaching the highest notch of completeness; imbue the patient with your own idea of what is attainable in his behalf, and with your own aim as high as it should be, there will be no higgling over a five dollar fee, but a generous willingness to compensate for the time and skill bestowed. If you chance to lose a bill or two, don't lay it to heart, but keep right on, and the reward will come somehow. Young dentists overslaugh such operations, and yet think their own services just as good and worth just as much as anybody's; and either take to charging prices which are entirely beyond their deserts, or to abusing those who have attained excellence through years of application and experience. No young man ought to think himself fit to enter practice who has not had seven years of practical training.

That teeth which had been loosened by the encroachments of tartar, or from other causes, might be restored, together with the edges of the internal and external alveolar plates, he had abundantly proved. It was necessary for this that the attachment of the dental ligament to the neck of the tooth should be maintained at some point; and from this would appear the importance of preserving that membrane intact in all dental operations.

In reply to a question from Dr. John Allen, Dr. Atkinson asserted that the teeth were undoubtedly nourished by the fluids of the mouth.

Dr. J. S. Latimer said that if the boys must practice seven years before they are fitted for practice, they must needs find somebody during that time to practice upon. He liked the idea of individualizing the teeth; it enabled the operator to be much more thorough in cleansing them. Prevention being always better than cure, it was best that children's teeth should be brushed from their first appearance, and the child thus accustomed to a habit which would strengthen with its growth.

Dr. C. E. Latimer having made a number of experiments as to the effects of acids upon the teeth, had found them all, though not equally, destructive. Nitric acid left a smooth and white surface, while sulphuric discolored the tissue, but they were all injurious, and should be avoided.

[Much was said as to shapes of instruments which cannot be made intelligible without diagrams.]

Dr. J. S. Latimer presented a specimen of sheet rubber, nearly white, for use in operations in the mouth. It was referred to a committee to report on its usefulness.

An opportunity was then afforded by one of the members for the application of the sheet rubber to various teeth by Dr. S. C. Barnum, the inventor of this very useful application.

Dr. Horne stated that the remarks of some present, and the references in the dental journals, showed that this invaluable use of rubber was not appreciated as highly as it should be, which he attributed to an imperfect understanding of the manner in which it should be applied. In the first place, good rubber is indispensable, that will bear a severe strain without tearing, about three times as thick as ordinary writing paper; a piece 5 by 8 inches is large enough for almost any case, and one much smaller will frequently suffice. In this holes are cut for the passage of the teeth to be protected, which are thus isolated and kept perfectly dry. The size of the holes should be about one-tenth that of the teeth they are intended for; they should be cut perfectly round with a punch, or by folding the rubber to a corner where the hole is desired. One or more teeth on either side of that to be filled should always be included, each with its separate collar, where the crowns approximate closely an eighth of an inch left between the apertures in the rubber will allow for the greater space at their necks and for tension; where they stand apart, a greater allowance

must be made. The rubber is carried to its place between the teeth to their necks by means of waxed floss silk; its application to back teeth may be facilitated by securing one end of the thread in a file carrier, which may be used in the mouth, while the other end is held by the fingers. The lip of the rubber clasping the tooth must be carefully worked under the free edge of the gums *toward the root.* This is an important point, for if the tooth be hugged ever so tightly, with the lip directed toward the crown, leakage will be inevitable. Should it prove difficult to pass the silk and rubber between the teeth, start them apart with the wedge, which may be done on the instant, but this is seldom necessary. The natural shape of teeth will often retain the rubber in position; but if this prove insufficient, a silk thread around them interlaced from one to another, close to their necks, and tied in a knot, will effectually prevent its slipping off. In some of the most difficult positions, where the decay reaches below the edge of the gum, Dr. Barnum has devised some delicate steel clamps for holding the rubber down to its place. There are innumerable modifications with which this simple article may be applied for the purpose of keeping teeth dry in the wettest mouth, and for an indefinite length of time.

Dr. John B. Rich expressed his pleasure and satisfaction at the adaptation now seen for the first time.

An automatic mallet, made by M. M. Johnson, was submitted for the inspection of the members, and referred to the appropriate committee.

Dr. Atkinson exhibited instruments for cleansing teeth, which were much admired.

Dr. Roy suggested the use of a single thickness of sheet-lead as packing for vulcanizers, which he had found superior to rubber.

The Society adjourned for the usual time.

MASSACHUSETTS DENTAL SOCIETY.

The annual meeting of the Massachusetts Dental Society was held in Boston, at No. 12 Temple Place, the President, Dr. N. C. Keep, in the chair. From 9 to 11½ A.M. there were dental operations, principally filling teeth under the latest improvements, performed by Drs. J. T. Codman, G. T. Moffatt, S. J. McDougall, and T. B. Hitchcock, of this city. These exhibited a high degree of skill, and were witnessed with no little interest. Dr. Shepard reported progress in regard to the establishment of the proposed New England Dental Magazine, of which Dr. T. H. Chandler had been appointed editor.

The election of officers for the Society for the ensuing year then took place, and resulted as follows:

President, E. G. Leach, of Boston; Vice-Presidents, H. F. Bishop, of Worcester, and E. N. Harris, of Boston; Corresponding Secretary, E. C. Rolfe, of Boston; Recording Secretary, J. T. Codman, of Boston; Treasurer, S. J. McDougall; Librarian, I. A. Salmon; Executive Committee, Dr. T. H. Chandler (Chairman), Dr. T. B. Hitchcock, Dr. George C. Moffatt, Dr. Edmund Blake, Boston, and Dr. L. D. Shepard, Salem.

Dr. T. H. Chandler was chosen orator for 1868, and Dr. S. J. McDougall as substitute.

The following persons were chosen delegates to the meeting of the American Dental Association in Cincinnati, in August:

Drs. D. G. Williams, J. T. Codman, E. Blake, J. Thompson, C. F. Horne, W. S. Miller, T. H. Chandler, G. B. Harrington, A. Brown, W. K. Mayo, C. Whitechurch, D. W. Leach, and A. Papineau.

Dr. Leach, on taking the chair, paid a merited tribute to the efficiency and services of the retiring President, and expressed his own thanks for the honor conferred upon himself.

Henery F. Bishop, D.D.S., of Worcester, then delivered the annual address. His subject was: "The Present State of Dentistry, a Chronological Survey of its Rise and Progress, the Important Developments of the past year, and the increasing claims of the Science upon an Appreciative Public." He first spoke of the success and continued prosperity of the Massachusetts Dental Society, and remarked that it was a very fortunate fact that none of its members had died during the past year. Dr. Bishop then reviewed the early history of the profession, and argued that it must have originated almost with the infancy of the race. Hippocrates, 400 years B.C., made mention of false teeth, and also spoke of fastening them with gold wire. Other authorities of remote ages were also alluded to; though many valuable records upon this subject were doubtless lost with the destruction of the Alexandrian library. Teeth were probably first stuffed to alleviate pain, and were afterward filled for the sake of their preservation. Stuffed teeth have been found in mummies, but we have no knowledge to determine whether it was done before or after death. Not, however, until the eighteenth century were there any scientific dentists known to the world. Before this time artificial teeth were made of ivory and hippopotamus' tusks; but in 1774 the idea of porcelain teeth was suggested by a French chemist, who made some of this substance which were of a light gray color. For this invention he was honored by membership with the French Academy. Soon after this the science made remarkable advancement in France, Germany, Switzerland, Austria, and England. Robert Woofendale, an English dentist of great skill, removed to this country about the time of the revolution and settled in New York. Dr. Gardette soon after established himself in Philadelphia, and was the first to use suction plates, for the purpose of securing teeth in their places,

and to use gold leaf in lieu of tin and lead for filling cavities. John Greenwood was also a very successful dentist of the time, and had the honor of attending, in his dental capacity, George Washington, and the latter afterward sent him a very complimentary letter in acknowledgment of the service Dr. Greenwood had rendered. [This letter was read by Dr. Bishop, and was dated Mt. Vernon, Jan. 1795.] The speaker then reviewed the vast progress the science had made during the last thirty-three years, and especially in the United States, which now has the acknowledged supremacy in this branch of the medical profession over all other countries. Dr. Bishop then spoke of the various dental colleges and associations that had been established in various parts of the country. The speaker then discussed the subject of diplomas, and approved of the legislative enactments which had been recently passed in various States for the suppression of quackery in dentistry. We live, he said, in an era of the poor and cheap; but dentists should always strive to do their best. There is no mediocrity in God's work, and we are instructed by holy writ to take Him for our pattern. Dr. Bishop closed his address with an eloquent extract from Webster on the duties of men to their fellow-beings.

Dr. Bishop's able and interesting address was received with generous applause, and at its close a motion was made that a vote of thanks of the Society be passed to Dr. Bishop for his able address, and that 500 copies of it be struck off for the use of the Society.

A division of the motion was called for, and the vote of thanks passed separately; but the motion for the publication of the address gave rise to considerable discussion, in which various gentlemen took part.

It was at last voted to refer the whole matter to the Executive Committee, and the meeting then adjourned to reassemble for the annual dinner at the Tremont House, at 3½ o'clock.

The dinner was served in an excellent manner, and when appetites had been appeased, brief and pleasant after-dinner addresses were made by Drs. Leach, Keep, Bishop, and others.—*Boston Post.*

LEBANON VALLEY DENTAL ASSOCIATION.

BY S. H. GUILFORD, D.D.S., LEBANON, PA.

A REGULAR quarterly meeting of the Lebanon Valley Dental Association was held at the office of Dr. James Fleming, in Harrisburg, on Friday eve, January 11th, 1867.

Members were present from Harrisburg, Bernville, Reading, Pottsville, and Lebanon.

Dr. Guilford, the appointee, read an essay on "Proximal Fillings in Bicuspids and Molars," of some twenty minutes' length. In beginning,

he said that it would be impossible, in an ordinary essay, to treat of all fillings under the heading, so he would speak principally of those which were of medium or larger size. In reviewing the methods advocated in *books*, he said he did not like the filing of the V-shaped cavity, recommended by Taft and modified by Tomes, because it gave the teeth a very unsightly and unnatural appearance, and took away from them much of their substance, which was not afterward replaced in filling. He objected to Harris' plan of cutting away the buccal surface, and filling from the lingual outward and finishing on the buccal, because it presented too much gold when completed.

In preference to all these, he advocated the cutting of the dove-tail space from the enamel and dentine on the masticating surface, and replacing this again with gold in finishing. He urged the use of the wedge in all cases, and the rubber dam whenever it could be applied with advantage. He always commenced these fillings by laying a cylinder of non-adhesive foil against the cervical wall, and then following down and finishing with adhesive foil, assisted by the mallet. The advantages of filling in this way were, that no gold was presented to view, the teeth suffered no loss of substance except such as was replaced afterward by the gold, and the open space on the masticating surface afforded the operator an opportunity of seeing all parts of the cavity with the naked eye, both while excavating and filling.

Dr. Geo. W. Stine approved of the plan of filling proposed by the essayist, and said it was his custom to fill in precisely the same manner.

Dr. W. K. Lineaweaver filled these cavities similarly, except that instead of the cylinder he started at the neck with retaining points and adhesive gold.

Drs. J. Fleming and W. K. Brenizer were in the habit of filling these cavities in the manner described by Tomes.

Dr. T. Y. Brown's plan of operating in these cases was very similar to that of the essayist, and laid great stress upon the importance of the wedge.

Dr. J. W. Moffitt thought that for these and for almost all other cavities, one of our best friends was the rubber dam.

Dr. Brown was appointed essayist for the next meeting, to be held in Lebanon on April 12th, 1867, and Dr. Moffitt was asked to explain, at our coming meeting, Dr. N. W. Kingsley's appliance for cleft palate.

On motion, adjourned.

The Lebanon Valley Dental Association met again, at Dr. Guilford's office in Lebanon, on April 12th, 1867.

Present—Drs. Brenizer, Brown, Moser, Scholl, Lineaweaver, Moffitt, Stine, and Guilford.

The essayist of the evening, Dr. Brown, of Reading, then read a very interesting essay on "Proximal Fillings in Incisors and Canines." He divided fillings of this kind into the four grades of superficial, simple, deep seated, and complicated, and spoke of each one at considerable length. In the superficial, he separated the teeth gradually with rubber, and then removed decay with file, afterward polishing the filed surface. In the simple, he recommended great care in excavating, especially at the cervical wall, and in filling did not often use retaining points, but introduced first a piece of gold larger than the rest, and held it in position with an instrument in the left hand, while the filling was being completed. The deep seated he filled the same as the simple, except that he laid a cylinder instead of a large pellet against the cervical wall as a foundation on which to build. Where the dentine was thin and yielding over pulp, he recommended its protection by a thin piece of gutta-percha or some other non-conductor. For overcoming sensitiveness, he has used the arsenical paste, applied only for a few minutes, but prefers chloride of zinc. In the complicated class, or those where destruction of the pulp is involved, he usually found that the arsenical paste applied for twenty-four hours was sufficient. He frequently used and very much liked a spray of rhigolene while removing a partially devitalized pulp. In filling the canal, he rolls his gold into thin cylinders, and saturates first one with creasote before introducing. Does not use pledget of cotton saturated with creasote before the gold. He strongly advocated the use of the wedge and the mallet.

A discussion on the subject of the essay was then participated in by nearly all present, which lasted for more than an hour.

Geo. W. Stine, D.D.S., and J. Vallerchamp, D.D.S., of Harrisburg, were then elected to membership.

The annual election for officers being in order, on motion, the present officers were unanimously re-elected to serve another year.

Dr. Moffitt then gave a very lucid description of Dr. Kingsley's old and new methods of making artificial substitutes for cleft palate, and illustrated each method with models.

Dr. Moffitt was chosen essayist for the next meeting—subject, "Aluminium Base." After midnight the Association adjourned, to meet in Reading on the second Friday in July.

MARYLAND ASSOCIATION OF DENTISTS.

March 28.

Annealed Gold.—Dr. G. S. Fouke spoke at some length upon the nature and use of *annealed gold foil* for filling teeth. In 1855, Dr. Robert Arthur, President of the Maryland Association of Dentists, first formally brought to the notice of the profession the method now so universally followed, of using gold foil with positive properties of adhesive-

ness. The method is simply to heat the gold prepared for being introduced into the cavity to a dull red heat, and "to condense the gold thoroughly, in small portions, with sharply serrated instruments." This method of using gold foil was an indubitable improvement. It had given an impulse to improvement in the manufacture of gold foil. This was an inevitable result of the use of gold foil with the adhesive property. Before its formal introduction and use it was deemed desirable to get rid of the property, which was done by using a very small amount of copper as an alloy, or by treating the sheets of foil with sulphur.

It is requisite that gold foil should be absolutely *pure* for the highest degree of *cohesibility.* The effect of different alloys was noticed. It was ascertained that *one* grain of copper would impair the cohesive property of *one thousand* grains of foil; that one grain of brass would injure the same property of *six thousand* grains; and that one grain of tin would spoil *ten thousand* grains. This was sufficient to show the exceeding susceptibility of gold to be impaired in the great property of adhesibility. It was the opinion of the speaker that *silver* also impaired the property of adhesiveness of gold. The effect of silver upon gold foil was appreciable particularly upon the *malleability* and *ductility* of the foil. Foil with traces of silver in it *adhered,* but it was hard and intractable under the instrument. *Pure* gold was inherently cohesive; pure gold foil was adhesive, malleable, and ductile; it was "manageable" in the hands of the operator. What constituted the property of adhesiveness in gold, and what influences would affect it, were adverted to. It was the remarkable and peculiar property of *gold* to "weld" or to adhere, *when cold,* after being annealed. This property disappears or is impaired by various causes, but is restored again by the action of heat.

The instruments for using annealed gold were considered. The speaker described his instruments, and preferred the *circular* point to the *angular*, in most of the operations of condensing the gold. Rounded points, corresponding to the convex surface of a hemisphere, with well-defined, but not too deep, *sharp* serrations, were efficient forms for consolidating annealed gold foil.

The use of the *automatic mallet* was commended. In the condensation of annealed foil the mallet he thought invaluable. Its action was entirely philosophical; and in the hands of a good operator the "*machine*" was as *intelligent* as the ordinary hand-pressure instrument. The stroke of the mallet upon gold, with the property of *malleability* unimpaired, was far more effective than the force of simple pressure, and produced more reliable work. The mallet, he thought, was both *labor* and *time-saving.*

The use of annealed gold foil, in combination with soft or non-adhesive foil, was referred to, and the speaker's method of using the two forms of foil was explained. The comparative value of "shred gold" was noticed,

the speaker regarding it, both in the light of his experience with it, and also from the very nature of the "preparation," as a mere *addendum* to gold foil. No form of gold, he thought, was equal to "*foil;*" and foil, with the property of adhesiveness, he esteemed the best, most useful, and valuable.

MISSOURI DENTAL ASSOCIATION.

SECOND ANNUAL MEETING.

Dr. Judd, the President elect, in the chair, Dr. Crawford Secretary.

Dr. Eames, of St. Louis, read a paper on "Mechanical Dentistry."

He did not desire to speak of the mere making of artificial teeth, but principally of the appliances and modes by which teeth should be made, not in imitation of one set model, but as nearly as possible to represent the teeth of every nation. The nationality, the form of the face, the color of the eye, the shape of the lips, the outline of the jaws; all these should be consulted to give a natural appearance, which was the highest artistic effect that could be produced. Thus in many cases where this taste was ignored, a ghastly, horrible effect had been brought about the face, especially the lower part seemed altogether false. The teeth were arranged much in the form of a circle, with the idea of plumping sunken cheeks; but this could not be done by crowding the mouth with teeth in a way foreign to nature, and which often interfered with mastication. Other teeth were, again, too long, and the muscles accordingly were constantly wearied by being never permitted to rest in a natural condition. If any one doubted this, let him place a sheet of common paper between his teeth and let it remain there for half an hour, and he would soon be convinced by the dreadful weariness of his jaws. He then concluded his able essay by pointing out the importance of using a variety of substances as one or other condition of patient might require it.

Dr. Hibeler, of Carondelet, read an essay "On the Action of Acid on the Human Teeth."

The next essay was read by Dr. Griggs, of Warrensburg, as follows:

I have, at the request of Dr. H. E. Peebles, of this city, and Dr. M. McCoy, of Boonville, prepared this paper—a simple statement of a case of necrosis of the inferior maxilla, and its treatment. The patient (a boy about eleven or twelve years of age) was brought to my office by his father during the latter part of last summer to have a tooth extracted—the first inferior molar on the right. The family physician, not having examined his mouth, supposed its diseased condition caused by said tooth being abscessed, and sent him to me. On examination I pronounced it a case of necrosis, though to what extent I could not say, as the patient was so much excited by fear that I could not quiet him to make a thorough examination. I advised the immediate removal of the diseased

bone, as the little fellow's constitution was sorely tried by the fetid sanies constantly taken into the stomach. He was very much emaciated, and face swollen ; I did not think it proper to wait the slower process of exfoliation. The disease had a twofold origin—the primary or irritating cause, I think, was some prepartion of mercury given during a very severe attack of cerebro-spinal meningitis, and the secondary cause was the constitutional debility or anæmia following the disease or during convalescence,—the blood being unable to furnish nutritive material. The location of the disease was caused indirectly by a decayed tooth ; the first right inferior molar coronal cavity pulp being exposed, caused him to masticate his food on the left side of the mouth, and thus for want of cleanliness salivary calculus collected around the necks of the teeth on the right, causing a chronic form of inflammation. The father refused to have the operation performed, but came again August 14th to have the bone removed, and gave him into my hands for treatment. The gum had separated from the bone, and exfoliation had taken place posteriorly, and the necrosed portion comprised the alveolar processes of the five posterior teeth from the lateral incisor, and the whole of the inferior maxilla from the ramus to the lateral incisor above and to the symphysis below. (The dens sapientiæ escaped by being in the ramus.) The face was very much swollen and patient more emaciated, with large ulcer just back of the symphysis. I commenced the operation by dissecting the gum from over the anterior extremity of the bone. I then grasped it with a pair of curve-beaked forceps, broke the anterior attachment as I would the attachment of a tooth ; raised the posterior extremity ; pressed it backward toward the soft palate until the long point of bone under the lateral could be raised above it, when I removed the bone from the mouth. The reason that I broke the attachment was that exfoliation had gone so far that I thought the bone weaker at the junction of the healthy and necrosed bone than any other place, and that if a small portion should be left it would come away in a short time. After the hæmorrhage ceased, so as to permit it, I touched the parts with a solution of nitrate of silver; prescribed plenty of good, nutritious diet, and, as soon as practicable, plenty of exercise in the fresh air, and sent him to a physician for a tonic ; afterward prescribed tincture of iodine, undiluted, to paint the parts, in place of the solution of nitrate of silver, and a solution of chlorate of potassa as a mouth-wash. Fourteen or fifteen days afterward the swelling had subsided, and the ulcer was healing rapidly and general health much improved. Now, eight or nine months after the operation, new bone has formed, granulation having taken place, and with the exception of a want of teeth on that side of the mouth and that the new bone describes a little larger arch than the old, you cannot detect the loss.

Dr. Peebles read an essay on neuralgia from Dr. Reed, of Macon City, which was eminently scientific, and spoken of in high terms by many present.

Dr. McKellops rose to move the appointment of a committee to investigate certain matters in connection with the Missouri Dental College, which was seconded and adopted.

Dr. Peebles read a paper on "Ethics."

Next in order was an essay on "Mechanical Dentistry," by Dr. E. Hall, succeeded by another on the same subject by Dr. John Matthews. The next was on "Popular Education on the Subject of Dentistry," by Dr. Brewer, of Palmyra.

Dr. John R. Matthews then read a second essay on the "Filling of Teeth."

Dr. Peebles suggested, as there was yet time before five o'clock, that the President should be requested to narrate his experience during his visit to Philadelphia.

Dr. Judd, in response to the suggestion, said that he would be very happy to do so, as it would give the members of the Association some idea of the influences that had been brought to bear against the Missouri Dental College. Last year, as they all knew, a convention had been held in Philadelphia of the dental colleges of the United States, which was attended by the faculties of the respective colleges. Their object in assembling had been to frame a system of laws and regulations which should be common to all, to arrange a common curriculum, and to make the requirements of each college identical if possible, or at any rate as nearly identical as they could manage. Being one of the faculty of the Missouri Dental College, he had been appointed the delegate to the meeting this spring. Now they knew that the organization of the college had been so late in the season that they had no opportunity of advertising it abroad before the lectures commenced. He was satisfied that studied efforts had been made to prejudice the College Convention against the Missouri Dental College; which had been represented as *bogus*, as got up for the purpose of conferring honors and emoluments on certain parties, as being unattended by men of good standing, and as counting no scientific men in its ranks. All this, and much more of the same sort, had been instilled into the ears of the members of the Philadelphia convention, and he felt, on arriving, that their minds had already been made up. They treated him with much personal kindness and attention, and invited him to sit, *ipso facto*, among them, though without, of course, the power of voting. But there was a resolute determination not to hear the claims of the Missouri Dental College for admission; it was to be silenced, to be crowded down. Well, he went round and talked to every member of that convention, and succeeded in getting a full discussion and having the thing exposed. Nay, more, by an *unanimous* vote the Missouri Dental College was invited to join the Association, and now, he was proud to say, was an unit of the Association of the Colleges of Dentistry.

The President said he would take the opportunity of nominating Drs.

Townsley, Brewster, and Black as the committee of three appointed in the morning's session.

Dr. McKellops made a motion that the members of the Association be declared members of the Missouri Dental College.

Seconded by Dr. Peebles and unanimously adopted.

The corporators held a side meeting and confirmed the adopted motion of Dr. McKellops.

The Association then adjourned, and proceeded, that is, the major part of them, to the City Hospital, where they were received by Drs. Hodgen and Stevens, and by Dr. Clarke, the resident physician. They inspected everything, were shown the improvements destined to take effect, and returned highly pleased.—(*St. Louis Democrat.*)

[The only objection to admitting the Missouri Dental College to representation in the Association of the Colleges of Dentistry, was the fact that there were no Professorships in Operative and Mechanical Dentistry connected with the institution, and it was very properly held by the members of the Association that the institution could not be regarded as a complete Dental College without those important Chairs were fully incorporated. The Missouri Dental College having created those Chairs since the meeting, all the objections are removed, and by agreeing with the rules and regulations of the Association, has the right to unite with it.—J. H. McQ.]

AMERICAN DENTAL ASSOCIATION.

This body meets, according to adjournment, in the City of Cincinnati, on the last Tuesday of July, 1867. It is confidently expected that there will be a large attendance—probably larger than ever before. In order that the meeting be one of interest and profit, all the members should come with the full purpose of accomplishing the most possible.

Every one should come with a purpose and preparation to do his full share of the work. The responsibility of making the meeting an interesting one does not rest upon the officers, nor upon any committee, but it does rest upon *all the members* who may be present; and hence we hope that every one will bring his contribution, and time shall be afforded for its presentation.

The time of the Association, so far at least as the arrangements of the Executive Committee are concerned, shall be devoted exclusively to its legitimate work; outside attractions will be wholly ignored during the time of the sessions. We say this because of a thorough conviction that the members of the Association wish to have it so.

The Executive Committee have made ample arrangements for the accommodation of the Association. Hopkins Music Hall, on Fourth Street, near Elm, a very excellent room, has been secured. There are sufficient ante-rooms, and a fine room for clinics.

The Committee will be at the room as early as eight o'clock, on the morning of the first day, for the purpose of receiving the credentials of new members. It is desirable that that part of the business be done before the regular hour of meeting, so far as practicable. Delegates will therefore report early.

Arrangements have been made for the accommodation of the members, with the Burnett House, the Clarenden Hotel, and the St. James, in either of which the accommodations and arrangements will be all that the most fastidious could desire.

Any parties wishing to secure rooms, can do so by notifying Dr. H. R. Smith, of this city, who will give prompt attention to such requests.

Very efficient arrangements have been made for the presentation and exhibition of instruments and appliances. We hope that all members having anything new and valuable, or even though it may be old and valuable, and not generally known to the profession, will not fail to bring it in. A fixed time each day has been assigned for such exhibition.

Any articles for exhibition, consigned to Dr. H. R. Smith, will be received and taken care of by him.

J. Taft,
W. H. Goddard,
H. R. Smith,
Com. of Arrangements.

ST. LOUIS ODONTOLOGICAL SOCIETY.

At a meeting of the dentists, members of the St. Louis Odontological Society, held at the dental rooms of George H. Silvers, D.D.S., corner of Pine and Fifth Streets, on the evening of June 8, 1867, the following resolutions were unanimously adopted and ordered to be published by the members thereof:

Resolved, 1st, That the filling of cavities in teeth with amalgam is injurious and detrimental to health.

Resolved, 2d, That as a society we discountenance the use of amalgam in dental surgery, and will not use it.

Resolved, 3d, That we are prepared always to defend the principles herein laid down, and invite discussions thereon.

Jos. Payne, D.D.S.	Geo. H. Silvers, D.D.S.
John P. Hibler, D.D.S.	G. G. Samuel, M.D.
C. W. Gill, D.D.S.	T. W. Eckert.
C. W. Tranernicht, D.D.S.	Geo. W. T. Arnold.
George Jenkins.	Thos. Aitkin, D.D.S.
Jas. B. Chess.	J. W. Plummer.
R. W. Terlein, D.D.S.	E. F. Steck, D.D.S.
Chas. D. Ludwig, D.D.S.	E. S. Ulman, D.D.S.
M. Right.	R. H. Mace.
Alex. Deinst, D.D.S.	E. C. Franklin, D.D.S.
J. F. Hapell, D.D.S.	L. M. Schmucker, D.D.S.

A. M. Austin.

NORTHERN OHIO DENTAL ASSOCIATION.

The Northern Ohio Dental Association held its annual meeting at Cleveland, on the 7th and 8th of May. The election of officers for the ensuing year resulted as follows:

President—Dr. B. F. Robinson.

Vice-President—Dr. C. H. Harroun.

Secretary—Dr. W. P. Horton.

Corresponding Secretary—Dr. C. R. Butler.

Treasurer—Dr. Chas. Buffett.

Delegates to the American Dental Association—Drs. F. S. Whitstar, Templeton, C. H. Harroun, C. C. Carroll, B. F. Robinson, Chas. Buffett, and J. E. Robinson.

Essayists were appointed upon various subjects.

This meeting was very well attended, and very much interest was manifested in the general subject. W. P. Horton, *Secretary.*

NEW YORK STATE DENTAL DELEGATION.

The New York State Dental Delegation will hold its third annual meeting at Syracuse on the 25th day of July next. The Executive Committee, composed of Drs. Perkins, Young, and French, will secure a suitable hall for the sessions.

All dental practitioners in good standing are invited to take part in the deliberations. J. S. Latimer, *Recording Secretary.*

New York, April 30, 1867.

EDITORIAL.

PUBLISHER'S NOTICE.

This number completes the eighth volume of the Dental Cosmos. Its publication was commenced in August, 1859, and the subsequent volumes have dated from that month. This fact has been the cause of misapprehension and annoyance to subscribers, many of whom desired their subscriptions to commence with January, which, if allowed, gave them and left us incomplete volumes; and, if not allowed, was apt to cause misunderstanding. In view of these facts, it has been determined to publish one volume of five numbers, commencing with August and closing with December, 1867, in order that subsequent volumes may date from January of each year.

The price of this volume, which will be complete in itself, with index as usual in the last number, will be $1.00. The 1st of January, 1868, will be the commencement of the tenth volume.

Those who desire to renew their subscriptions are requested to do so at as early a date as possible, that we may determine the number of copies to be published. S. S. White.

LEGISLATIVE ACTION RELATIVE TO THE PRACTICE OF DENTISTRY.

In the preceding number of this magazine there was published a petition and bill presented to the Legislature of Kentucky, by a number of prominent dental practitioners in that State, asking for the passage of a law making it obligatory upon all practitioners of dentistry either to possess the diploma of a dental college, or pass a satisfactory examination before a board of examiners appointed for that purpose. The profession in other States in the West is moving in the same direction; but what the prospect of ultimate success may be is difficult to say.

With no disposition to underrate the importance of such movements, but, on the contrary, recognizing that the enactment of some such laws would be of advantage to the profession and the community, it yet must be evident to close observers and thinkers that, in professional matters as in morals, the most effectual means for securing an elevated standard is through education rather than by the enactment of prohibitory laws which by some means or other may be evaded. The condition of affairs which makes the passage of such laws necessary is due to the fact that in the past, while a few capable and far-seeing men as private preceptors have done everything in their power for the proper preparation of students, and, in addition, insisted upon a collegiate education, the profession at large has not given the dental colleges that hearty support which they were justly entitled to receive, and there has been very great laxity on the part of many practitioners with respect to office students. Persons unfitted for professional life, so far as general education is concerned, after remaining a few weeks or months in the offices of men too often utterly incompetent to instruct students in anything but the merest rudiments of the mechanics of dentistry, have passed into the ranks of the profession, and each of these in turn taking students, have swelled the number of incompetents to a fearful extent, and the injuries inflicted by them have become so apparent that at last the strong hand of the law is appealed to for protection. The true remedy now, as in the past, is in the hands of the profession. It is insisting upon the most thorough preparation on the part of those seeking to enter its ranks. This is a duty which the profession owes not only to a generous and confiding public, which has too often been grievously imposed upon by plausible pretenders, but also to itself as the only means whereby it can justly secure and maintain the position of a liberal profession, and afford the protection and encouragement that should be accorded to individual members who are honestly striving to advance its best interest. If every practitioner from this time forth would resolve to take no students who do not give evidence of fitness for professional life, and are unwilling to devote two years to the study of the profession, and graduate from some dental

college, there would be no occasion for prohibitory laws. As a consummation so much to be desired, however, is not likely to be realized without the aid of the law, it is to be hoped that it may be to some extent accomplished with its assistance. J. H. McQ.

SELECTIONS.

DENTAL REGISTER OF THE WEST.

BENEFICIAL EFFECTS OF SUNLIGHT AND EXERCISE IN THE OPEN AIR.—At a meeting of the Mississippi Valley Association of Dental Surgeons, the following interesting and instructive experience was given by Dr. S. S. White of a plan by which health may be secured:

"I wish to give you some of my experience, which I hope may be of immediate service to you. We recognize the higher power of nerve force, as the highest we know anything of in our organization—that which enables us to think. I have proven, in my own case, the value of the principles stated, having brought myself from that of an emaciated, pale-faced person, weighing but one hundred and twenty-one pounds, to that of a person weighing one hundred and seventy-one pounds, with a full face and florid complexion, in which there is no alcoholic or other stimulant. I accept it as a truth that the most immediate attainable power for the conversion into red blood globules, and converting it into gray matter, is the direct rays of the sun. I have put it in practice and tested it. We know that it is so in vegetable, flower, or fruit growth. The fact that vegetables deprived of light do not develop themselves fully is well known to all. But where they are furnished with abundance of light, but deprived of direct rays of the sun, the vegetation does not develop itself to the same intensity—the higher qualities of the fruit are not evolved, although exposed fully to the northern light; they must have the influence of the direct rays of the sun also.

"To make this applicable; in looking around on the dentists here, I find that they partake of the general character of dentists; whatever their constitution, they are pale, owing to their inactive in-door occupation, keeping themselves shut up six days in the week out of the sun.

"If I were their medical adviser, I would advise them to take one or two hours in the middle of the day to expose themselves to the direct rays of the sun.

"The habit can be easily acquired, and will become a luxury, even when perspiration is freely developed in the sun, in the hottest days of the year. When in health it is the best way to retain it, and if out of health, the best way to regain it.

"I have found when overworked by brain work, as I have sometimes been, that the readiest means to recover my health, was by exposing myself thus to the direct rays of the sun.

"When Dr. Spalding in his essay spoke of sleep as a means of restoring the gray matter, it reminded me of the fact, that when thus exposed to the direct rays of the sun, I needed but six hours' sleep, when I otherwise needed eight hours.

"Dr. Warder, who is an experienced horticulturist, in speaking on some of the points introduced by Dr. White, said that tropical plants, which of course existed under the immediate or more direct rays of the sun than we had here, could be grown by artificial means, as in our greenhouses we could raise a sufficient amount of heat, but they never thrived so well or produced the same result as under a vertical sun. He fully believed the doctor's remarks with regard to health; he did not know about his rosy cheeks, but he had a figure he was not ashamed of; one much superior to the one he carried about with him when he lived in Cincinnati. He had changed his appearance since he had become a farmer and had left off being a doctor; he was not shut up now as then.

"It is well known that the fruits well exposed to the light and sun are universally better developed in size, infinitely better in flavor, and much more highly colored than those that are not thus exposed."

AMERICAN JOURNAL OF DENTAL SCIENCE—JUNE.

"NOTES OF OBSERVATIONS ON THE CHARACTER OF THE RED BLOOD CORPUSCLE. By PROFESSOR RUFUS KING BROWNE, M.D.—There can be no doubt that it is a valid instinct in man, which has always assigned a commanding, if not supreme importance, in the complex processes of physiology, to the blood, and especially its red corpuscles. I have myself long been persuaded that all of the variations in these complex processes, which on the one side constitute health, and on the other disease—which two are only *divided* aspects of one and the same system, series, or sum of the animal functions,—will eventually be found to turn upon some change at a given time and under peculiar conditions, in either the rate of its progress, or the character of its main elements.

"Accordingly, I have during several years sought on many occasions to ascertain the true anatomical characters, and then deduce the career, of the red blood corpuscle.

"It is to this latter point that I propose briefly to ask attention, conscious that my observations, even with the highest known powers of the microscope, though repeatedly made very many times, have not as yet enabled me to affirm anything with entire certainty, yet I shall venture briefly to present the results of those observations.

"The red blood corpuscle is regarded as an enduring anatomical element, but I am confident that they are the least so of any anatomical form in the body. I am confident, though as a *demonstration* my observations would fail to establish that conviction in the minds of others, that they are perpetually solved in the liquid sanguinis, and as constantly renewed.

"This view is of course equally opposed to the notion on the one hand that they are permanent anatomical forms, and on the other, that they are 'destroyed' in any special organ of the body.

"The first striking feature of continued observation of these bodies, with *high* powers of the microscope, and without crushing them under the pressure of a covering glass, is that the *size* of each one of any given number of them varies between wide extremes, some being from three to four times the size of others. This great disparity is of course not sufficiently palpable to arrest the attention of the observer except under very high powers.

"The opinion generally received is that the human red blood corpuscle

is either a cell with red contents, the nucleus of which has disappeared, or that it is a free nucleus of a cell, and which, is not settled.

"Neither of these views appear to me to accord with the result of careful observations. It consists of matter of different degrees of density in different parts, being much more nearly fluid in the interior than the outside. To this fact is attributable the depressed centre, which is not however equally visible in all red corpuscles. It has been most generally described as having a cell-wall, after the fixed stereodox form of designation of all such minute anatomical forms; and this, long after the old and erroneous notion of a cell as a body having a triplex structure, in three distinct parts, as cell 'wall,' 'nucleus' and 'nucleolus,' has been abandoned by the higher order of observers with the microscope.

"When placed in some liquids, many of the corpuscles swell up and disappear, but in such cases I have never been able to detect any remaining cell substance.

"Dr. Beal has shown conclusively that the existence of this cell-wall must be abandoned as rather a theoretical notion than an ascertained or observed fact, although many observers have asserted the bursting of the corpuscle and the escape of its contents. Guinea-pig's blood crystallizes very rapidly in tetahedral crystals, and if the process be carefully watched in a drop of blood which has been treated with a very little water (and sometimes without the water), certain corpuscles will be seen to become angular, and four or eight prominent angles will be apparent, while others will exhibit the well-known stellate appearance. Afterward, the entire blood corpuscle will be seen to crystallize, and subsequently the crystals will be seen to coalesce and form larger crystals. Certainly no membrane nor anything resembling it exists here.

"The red blood corpuscle from the same animal differs in character considerably. Some are darker and harder than others; some are so transparent as to be nearly, if not totally, invisible, and some are not more than one-fourth the size of others. These facts, which appear to have escaped the attention of observers, are only applicable to the supposition that different corpuscles are in different stages of *growth* and progress.

"Experiments with coloring matter strongly confirm this conclusion. The white corpuscles of the blood can be very readily tinged with a solution of carmine and glycerin. The granular or nucleated corpuscle of the embryo is also easily colored, while the majority of the red corpuscles cannot be colored by the same means. Nevertheless, in certain instances, some of the smaller corpuscles in the capillaries can be readily colored. These, however, are very much smaller than the white corpuscles, and do not present their granular appearance. *They are undoubtedly young red corpuscles.* There are, however, other observed facts which can lead to no other conclusion.

"In winter, the capillaries of the common frog contain numerous oval corpuscles, not more than half the dimensions of the corpuscle when the same animal is active. In this case at least there can be no doubt of the fact that the former are *young* corpuscles. In the lymph canal, there may always be seen in the intervals of digestion small corpuscles of a similar character, and these may also readily be stained.

"These observations lead me to the conclusion that the red blood corpuscle is either the separate form of the aggregations of rounded particles, apparently granular, forming the white corpuscle, or of the corpuscles I

have designated found in the lymph canals, and that it undergoes a series of changes, by which it finally becomes converted into matter soluble inthe plasma, and that they are thus continually dissolved and replaced."

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"Goodyear Dental Vulcanite Company.—Caution to the Public.—Notice is hereby given that the license granted Dr. Locke, of Nashua, N. H., for the use of rubber as a base for artificial teeth, has been revoked. All persons are hereby cautioned against employing the above L. F. Locke, in the above-named branch of dentistry, as by so doing they render themselves liable to prosecutions for infringement.

"Josiah Bacon,
"Treas'r Goodyear Dental Vul. Co.

"*Nashua*, April 7th, 1867."

"Notice is hereby given that I, L. F. Locke, will 'warrant and defend' the parties against the above liability.

"The above license, though 'repugnant' and 'extortionary' in its terms, and considered groundless in its claims, was taken [under protest] by us on condition that all other dentists should do the same; yet not one in twenty of the dentists in the country have taken license or expect to.

"The claim is now contested in the courts, and is to be carried up to the U. S. Supreme Court for a final decision. We consider that we are entitled to hold in abeyance all taxes claimed until the right is fully established.

"*I have proposed to the said Josiah Bacon, to make quarterly returns and give him satisfactory security for the payment of all dues claimed with interest, whenever the right is fully established.*

"Is not that all any honorable man could ask? Ought not that to be satisfactory? If he had any confidence in the justice of his claim or in the final result, would he not accept these terms instead of trying to destroy the confidence of my patrons or injure my business by the above notice? The public can judge. L. F. Locke."

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American Journal of Dental Science—May.

"Reparative Surgery.—In the *Mariana* (Florida) *Courier*, we find the following account of an apparatus constructed by Dr. T. W. Hentz of that place, for which he deserves great credit:

"Mr Milton Mosely of this county was wounded, during the war, in his face, carrying away his entire upper lip, and nearly his entire nose; his palate was cleft its whole length, and all the front teeth carried away, making his appearance as unseemly as possible, and interfering with his speech and respiration to such an extent as to be extremely annoying. Dr. Hentz made for him a palate and teeth, an india-rubber nose, supported at its base by wires attached to the plate, and at its upper extremity by a pair of spectacles. Also attached a moustache to the upper lip, thus converting Mr. Mosely into quite a handsome man. His difficulty in speaking is removed, and the appliance, unless by close inspection, cannot be distinguished from a natural nose and palate. This ingenious contrivance can be removed and put back at pleasure."

PERISCOPE OF MEDICAL AND GENERAL SCIENCE IN THEIR RELATIONS TO DENTISTRY.

BY GEO. J. ZIEGLER, M.D.

"*On Healing by the First Intention.* By BENJAMIN W. RICHARDSON, M.A., M.D., F.R C.P., Senior Physician to the Royal Infirmary for Diseases of the Chest. The success attendant on the use of the styptic colloid fluid as a healer can only be understood when the simple natural principles of the process of healing by the first intention are fully comprehended. It will not, therefore, be lost time if I devote a minute or two to this subject.

"Let us, then, first fix in our minds the all-important demonstration, that healing by the first intention in the case of even a large amputation with sawn bone in the wound is an accomplishable fact. In the case I have related this is well proved. We are brought, therefore, from what can be done to what ought to be done, and as it is an unvarying law that whatever has been can be again, we may be sure that healing by the first intention may be made a steadfast fact in surgery whenever the exact conditions leading to such healing are known and applied.

"To come to the point from the negative side, when a wound does *not* heal by the first intention, it is prevented from the intention by the interposition of a layer of decomposing albuminous matter lying between its divided surfaces. This layer may be very thin and transparent, or it may be thick and dense; it may give an offensive odor, or it may (when it exists as purulent matter) give little odor; it may be transparent and colorless, or it may have various shades of color, from light gray to almost blackness. If we examine this fluid chemically, we find that it consists of modified albuminous matter, with or without fat; if we bring some of it in a state of actual decomposition into contact with other matter albuminoid in construction—such as blood, serum, dissolved fibrine, or even dissolved caseine—it quickly transforms all these into decomposing or decomposed matter like to itself, the conditions for the production of decomposition being supplied.

"The fluid, as it was first exposed to the air by the knife, came from the blood. It was in fact, the free interstitial plasma which before the wound was made was about to give form and substance to the solid structures, to muscle, connective tissue, or membrane. It was not a secretion, but a pre-existent fluid, which the knife disclosed, or rather exposed. If we tap a muscle under firm pressure, we can squeeze out this fluid. Squeezed from the limb of a sheep immediately after death, it is a thin, slightly colored alkaline serum, very easily coagulable. It is almost destitute of salts, and it has a mean specific gr. of 1025. It decomposes with extreme rapidity under circumstances favorable to change, but it can be kept free of decomposition by extreme cold for an unlimited time.

"When the living tissues are intact, this fluid plasma is always undergoing transformation from the fluid into the solid condition so as to make tissue; it thus binds and makes the connection between the water of the tissues and the solids. I shall one day demonstrate to you how this change actually occurs; for my present purpose it is sufficient to state that it does occur.

"When, then, a surgeon puts his knife through a living structure, he exposes not vessels only, not nerves only, not solids only, not blood only, but this interstitial fluid, as it is proceeding for solidification.

"Having exposed this fluid, he leaves a surface of it that has been exposed whenever he closes the wound; and this is the great point to remember, that healing by the first intention, or no such healing, turns precisely on the physical condition in which this fluid is thus left. If the wound be closely and well bound up before the fluid has had time to undergo change, then the fluid passes into solidification, becomes a bond of union of the divided parts, and sets up true healing by the first intention. But if the fluid has time to undergo change, to pass into one of the stages of its decomposition, then it does not solidify, and there is no true healing of a direct kind. Fresh fluid coming down presses before it the original fluid, and the process, as it is vulgarly called, of 'healing from the bottom,' is the natural sequence if the case goes well. It is astonishing how quickly, in some cases, the interstitial combining fluid undergoes change on exposure to the air. There is a physiological experiment which proves this very perfectly. You are aware Liebig once advanced the view that in the natural state the blood is alkaline, but that the muscular juice is acid. This view was maintained for years. In 1854, when I was working daily in the slaughter-house, studying the coagulation of blood, I was led to test the reaction of the muscles both of oxen and of sheep while the muscles were still irritable, and to my tests the reaction was always like that of the blood, alkaline. Such, however, was my respect for Liebig, and such the force of what may be called the habit of belief, I actually distrusted my own work, and thought, after all, Liebig must be correct, and I somewhere in error. At length, and while I was still hesitating on the matter, Du Bois Raymond boldly and truthfully came out with an exposition of the error of Liebig, by showing that during life the interstitial fluid in muscle is alkaline like the blood, but that if muscle be exposed to the air for the shortest period, there is a change to acidity. The facts are so; they admit of direct proof on the living animal, and, if care be taken in its preservation, they can be proved, for a short time, on the dead muscle, say the heart of a dead animal. We will test the point here with the heart of a sheep. This heart has been removed two hours, but kept excluded from air. I cut open a surface, test it instantly, and find a feeble alkaline reaction. I lay open the surface for so short a time as three minutes, and, testing again, I find it acid. In half an hour the reaction everywhere will be strongly acid. If the other tissues of a living animal be divided and tested in the same manner, the same phenomena are observed.

"In some cases this change is so active that from three to four minutes is sufficient to create it over the whole of the surface of a large wound. In other cases it is longer deferred: in a warm, perfectly dry air it is deferred; in a very dry, cold air it is deferred. It is quickened intensely by a warm, moist air; it is quickened by an air charged with organic matter, living or dead; and it seems as if there were peculiar conditions of the oxygen of the air, conditions of activity which also quicken it; a result quite natural, because the process is one of oxidation. Just as blood oxidizes in the lung on its exposure to air, so this interstitial fluid oxidizes when it is exposed to the atmospheric oxygen.*

* I would repeat here a point I have urged more than once—viz., that the surgeon will never have his science perfect until he carefully studies and understands

"Suppose, then, the oxidation is established, what is the sequence? The sequence is disposition to further change. The fluid, modified in character, is no longer a fluid ready to enter into substance with the solid tissue with which it is in contact. It lies as foreign matter, preventing adhesion, and communicating acidity to the new plasma that is poured into it. From this state there may be three results:

"(*a*) The patient, being healthy and well provided with good plasma, and air, and specially water, being excluded from the wound, the new plasma may neutralize and throw off the old, and with some discharge there may be more or less of spaces in which there is healing by the first intention.

"(*b*) The conditions being less favorable, the changed plasma, acting as a foreign body, may excite the production of great heat in the part—inflammation so called. In this state the plasma will sometimes be retransformed into a plastic, coagulable fluid, which will form adhesions with partial healing and some production of pus. Or in this state all the fluid may be transformed into purulent fluid—abortive plasma, which will be alkaline but not adhesive, which will protect the parts shielded by it from external oxidation, and will allow the natural plasma to build up new tissue from beneath—healing from the bottom.

"(*c*) There is one more major condition. The plasma, from becoming in the first place of acid reaction, may run rapidly into alkaline decomposition, with complete disorganization of all the colloidal parts, the interstitial plasma, the effused blood, the fibroid membrane, the osteoid and tendinous gelatine. When this disintegration occurs the constituents of the plasma are transformed into new and soluble compounds, susceptible of reabsorption into the organism, and even of absorption into other organisms. During this form of degeneration, not during the purulent form as was once supposed, the systemic malady, misnamed pyæmia, finds its origin. These phases, which I have described from their physical side, you will all recognize, with shades of difference, as *bonâ fide* parts of practice and of practical observation.

"Returning from these points to the treatment of an open wound, whether that be caused by accident or by operation, we are prepared to understand with precision many practical results to which we are blind so long as we are ignorant of the physics of the process of healing.

"In the olden time, the chirurgeon, having no correct knowledge how to close a wound, and seeing bad results from bad closure, set his face against closing altogether, and, filling the wound with tar and pitch placed on tow, made it always heal, as he said, 'from the bottom.' In an age when there were no scientific principles to guide the surgeon, this practice was not bad; it prolonged the cure, certainly, but it saved the consequences of alkaline decomposition. The dressing, containing a good antiseptic—that is to say, a powerful preventive of oxidation—allowed the new plasma to produce new tissue, and so there was healing. The surgery was rough, but, in the main, effective. It is still a sound practice in cases where a large surface or an abraded surface has been a long time exposed to air before coming under the hand of the surgeon.

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those meteorological conditions which are favorable to and unfavorable to the process of healing by the first intention. It is one of the best known experiences that cases of an unfavorable character constantly occur in rapid succession, for which circumstance there must be a cause. It would be well if in our large hospitals barometrical, hygrometrical, and thermometrical observations were made on every operating day, and carefully recorded.

"In time came Sir Kenelm Digby with his sympathetic powder as the bait and his reversal of the old practice as the success. Rub the instrument that inflicted the wound every day with the powder—that was the bait; tie up the wounded part quickly, tie it up in its own coagulating blood, and do not meddle with it for fourteen days—that was the cure.

"Various facts since the time of the sympathetic knight have proven the soundness of his practice apart from his superstition. There have been many practitioners who their lives through have acted on this plan in the extremest cases, and with the most surprising results. Mr. Adams, in one of his works, tells us of a surgeon who treated every case of compound fracture with perfect success by simply bandaging, closely saturating the bandage with compound tincture of benzoin, and leaving the rest.

"In the battle-fields of Egypt operations performed under canvas, in perfectly dry, heated air, in which all decomposition of albuminous matter is impossible—in which air, in fact, albumen itself dries into a horny covering—the process of rapid healing was a marvel to those who witnessed it.

"But the crowning facts which bear on healing by the first intention are those connected with the practice of subcutaneous cutting. I cannot make out that any true case of pyæmia has ever occurred after neat subcutaneous operation. In fact, in the results of subcutaneous section we see absolutely how, in an open wound, the prevention of cure is caused by some external influence brought to bear upon the wound. Except for this experience and the lessons it brings us, we might dream of constitutional tendencies and such like occult interferences with cure in open wounds; but the subcutaneous experience excludes them all.

"The sum total of scientific fact lies, then, in this—that healing by the first intention is only prevented in any case by a change in the interstitial fluid which laves the tissues, and from which they are formed, the cause of this change being exposure to the combined influence of water and oxygen. With this understanding we learn the reason why some operations are more serious than others. The risk of opening serous cavities—for example, the peritoneum—is explained when we remember how large a surface, covered with easily decomposable fluid, is exposed to the danger of decomposition whenever such a serous cavity is presented to the air. The peritoneum should never be opened except under special conditions. Thus:

"1. Let the operating chamber be small, and let few persons be present.

"2. Let the temperature of the air be low—never above 55° Fahr.

"3. Let the air be dry.

"4. Let the air be rendered faintly alkaline by ammonia.

"5. Let the operator have his hands protected with oil.

"6. Let the operator be content not to put water or wet sponges into the cavity.

"7. Let the operator forbid any hands except his own entering the cavity.

"8. Let no ligatures hang out of the closed wound to admit either air or water.

"9. Let the air in the cavity be carefully expelled as the wound is being closed.

"10. Let the closing of the wound be so absolute that no action of the diaphragm or emptying of the viscera shall draw air afterward into the cavity.

"To secure healing by the first intention in ordinary wounds, it is necessary to treat an open recent wound immediately before closing it as follows:

"To remove from it all long ligatures.

"To wash off the fluid with which it is covered, and then thoroughly to dry the surface, so that no water may be left to excite decomposition.

"To bring every part into close contact, so that no moist air may be left behind, and when the lips of the wound are closed with suture, to seal up resolutely with a fluid which perfectly anneals structure, like the fluid I have here brought under notice.

"To leave the wound in dry air; or, if that is not possible, to surround the parts with a simple substance, eager for water, but not caustic in its action. Such a substance I place before you in the form of washed and dried laminaria or sea-weed; a substance clean, light, and excellent as an absorbent of fluid coming from the body, or of water suspended in the surrounding air.

"From the time of Sir Kenelm Digby until this hour, surgeons have fluctuated between the two extremes, of healing slowly 'from the bottom,' and of healing quickly through the mass 'by the first intention.'

"I submit now that the time for this hesitation ought to be considered as over, and that the modern surgeon should neither hesitate, nor pause, nor tire, until he has made healing by the first intention a sure and certain portion of his art, and until he has lifted up that dark pall of surgical fever which the most eloquent of English surgeons tells us still enshrouds the most brilliant surgical exploits. I have aimed in the present lecture to give direction and solidity to this great work."—(*Medical Times and Gazette.*)

"*Nutrition and Physical Power.*—Careful and exhaustive experiments upon muscular action by Dr. Frankland, have led to the conclusion that animal mechanical power is principally generated, not as has been supposed, by oxidation of the muscles, or of the nitrogenous constituents of food, but by the non-nitrogenous elements, sugar, fat, starch, etc., through the medium of the blood. The blood is thus the true fuel for *both* the chief forms of force in living animals, viz. heat and mechanical power. The muscle is only a part of the machinery through which the force is utilized, and its waste and repair are analogous to those of the metallic parts of a steam engine. In Dr. Frankland's table, the theoretical force-producing capacities of the leading kinds of food are proportioned as follows: beef fat, 3,841; butter, 3,077; Cheshire cheese, 1,846; flour, 1,627; rice, 1,591; refined sugar, 1,418; yolk of eggs, 1,400; mackerel, 683; lean beef, 604; milk, 266; wheat bread, 910; potatoes, 422. The cost of the same articles for a given amount of work will be in the following proportions; beef fat, 550; butter, 1,250; Cheshire cheese, 1,150; flour, 375; rice, 550; refined sugar, 1,500; eggs, 1,450; mackerel, 2,500; lean beef, 4,250, milk, 1,550; bread, 475; potatoes, 525. Thus it will be seen that the most nutritious varieties of food are by no means the most economical sources of physical power, and it should also be remembered that the value of any food is even more dependent upon its fitness for the individual, than upon its richness. After all investigation, therefore, the primitive dictates of nature in the appetite, provided that has been kept healthy and sufficiently enlarged by experience, are the best rules we can obtain for diet."—(*Sci. Amer.*)

"'*Alimentary Preparation for replacing Human Milk for Children.*' By BARON VON LIEBIG.—Human milk of a person in good health contains, per cent., caseine, 3·1; sugar of milk, 4·3; butter, 3·1. Baron von Liebig concluded therefrom that woman's milk contains: Blood-forming principles, 1 part; heat-producing principles, 3·8 parts. By mixing flour and milk in certain proportions, it is easy to compose a food in which the two nutritive principles are in the same proportion as in human milk—viz., 1 to 3·8. Cows' milk contains, on an average, 4 per cent. of caseine, 4·5 of lactose, 2·5 of butter. If we take, then, 10 parts of milk, 1 part of wheat flour, and 1 part of ground malt, we have a mixture satisfying all the necessary conditions. For preparing this the author recommends the following method: A mixture is made of 15 grammes of wheaten flour, 15 grammes of ground malt, and 6 grammes of bicarbonate of potash; 30 grammes of water and 150 grammes of milk are then added. The whole is then heated and continually stirred until the mixture begins to thicken. It is then taken off the fire and stirred all the while. After five minutes it is boiled, and then strained through a wire or hair sieve. The ground malt necessary for this preparation is easily furnished by barley malt, obtained at any brewery. It can be ground in a common coffee-grinder, and then passed through a sieve. If this preparation is well made, it is as sweet as the natural milk; it is fluid enough, and keeps for twenty-four hours. In Germany the use of this food is very extensive, and its nutritive qualities are found to be excellent. It has a slight taste of flour or malt, to which children get accustomed—in fact, they soon prefer it to any other food."—(*Chemical News.*)

"*Phosphates.*—M. Collas, says F. Moigno, in his weekly letters to the *Chemical News*, continues his researches upon the phosphates in general, and, in particular, the phosphates of lime. M. Collas has, in fact, demonstrated that the phosphate of lime becomes a decomposing agent of putrefaction, and, after death, hastens the dissolution it was the means of preventing during life; it also favors the development of new existences.

"In pregnant women or wet-nurses there is an absence of phosphate of lime in the organism, and the presence in the urine of sugar. The phosphate passes in great part into the blood and milk so as to serve for the consolidation of the bones of the infant, which are at birth in a cartilaginous state.

"M. Collas advises the following preparations:

"1. *Solution of Phosphate of Soda*—namely, eight grammes of phosphate, in spring-water. To be taken at the rate of two or three glasses per day.

"2. *Phosphoric Lemonade.*—Phosphoric acid two grammes, in a litre of spring-water, taken from time to time as a beverage; hydrated phosphate of lime milk; ordinary hydrated phosphate of lime, fifty grammes; water, one hundred grammes, mixed together in a mortar, and passed through a strainer or fine sieve; one, two, or three spoonfuls to be taken daily, especially in soup. This is the best way of administering phosphate of lime to rickety children. The phosphate of soda has the property of converting sugar into glucose in presence of carbonic acid."—(*Medical Press and Circular.*)

Dentition of Marsupials. "*A New Discovery in Comparative Anatomy.*—The very able conservator of the Museum of the Royal College

of Surgeons, Mr. Flower, has lately brought a new fact of great interest before the Royal Society in reference to the dentition of that curious order or sub-class—apparently the first created of mammalia—the Marsupials, or pouched animals. One of the broad divisions of mammalia has hitherto been into Diphyodont and Monophyodont, or mammals having two sets of teeth and mammals having only one set. Of these the latter include the Cetacea and the Bruta, while the remaining majority of mammalian orders are all Diphyodont. If Mr. Flower be correct in his generalization—and the examples he adduces from the different sub-orders of Marsupials appear sufficiently numerous and remarkable to warrant him in making it—we might place these creatures midway between the Monophyodont and Diphyodont types; for in them we trace the first step toward a double set of teeth, the representative of the deciduous or milk teeth being reduced to a single tooth—a milk molar—which is succeeded by the hind premolar on each side in both jaws. Neither the incisors, the canines, nor the other premolars have any temporary predecessors, although, as Mr. Flower hints, it might perhaps be found that at a very early period of development some trace of their follicular stage might be present. This is the more probable, as in some known instances —*e.g.* some Rodentia—milk teeth are exceedingly evanescent and are shed *in utero*. But the existence of such traces is merely a speculation; whereas Mr. Flower's actual observation of the early stages of dentition in kangaroos, opossums, and thylacines completely support his position. He remarks that it is very interesting to notice that the deciduous tooth alone developed in the Marsupials corresponds homologically with that which is, generally speaking, the most persistent in typical Diphyodonts and in Man—viz., the posterior milk molar, replaced by the posterior premolar. We think, however, that even a higher interest is raised by the observation of this, so to speak, first intimation of the idea of Diphyodont dentition in the race of mammals which are the living representatives of the sole known mammalian life (Phascolothere and Ampithere) of the Mesozoic period, and we congratulate Mr. Flower on his discovery."—(*Medical Times and Gazette.*)

Tumor of Lower Jaw.—The reporter of the *Med. Times and Gaz.* says that "at a recent visit to King's College Hospital we saw a very interesting case of tumor in the lower jaw, caused by expansion of its walls, in a young lad, in which Sir W. Fergusson extracted a tooth and then broke into the dentinal cavity, and removed the contents, which consisted of a small quantity of gelatinous material. He had recourse to this method of dealing with the case for reasons which he had formed from a considerable number of cases which had occurred in his own and in the practice of other surgeons, in which capital measures had been resorted to at first, and a large portion of the jaw removed, when probably some conservatism might have effected in time as much. With regard to this puncture of the contents of the bony cyst of the inferior maxilla, he deduced his experience from similar cases in which he had seen the walls of the antrum expanded by growths not *of* the jaw, but *in* the jaw, such as the one now under treatment, semi-fluid growths contained in a bony cyst, which had been entirely cured by puncture and evacuation of the contents. He called to mind a case in which he removed a considerable portion of the lower jaw, and a large mass of dentine was found between the expanded, flexible laminæ of the body of the jaw. This, he considered, would have been a case for exhibiting the conservation of previously

scooping out the cavity before having resort to the formidable proceeding of removal."

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"*Temperament in Syphilis.*—In a paper read at a recent meeting of the Harveian Society Dr. Meredyth entered on the question of the influence of temperament in syphilis, and summed up his observations as follows: That the syphilitic virus is immediately absorbed on infection. That its first action on the organism is the molecular disintegration of the blood-corpuscles by catalysis, from which results an anæmia in the early and a cachexia in the last stage, caused by the exhaustion of the animal machine arising from the sustained efforts of an enfeebled organism to eliminate a destructive element in the tissues and repair their organization. That syphilitic lesions consist in a molecular disintegration of the tissues. That on the relative strength or weakness of the constitution depends the intensity of the accidents of the disease; on the temperament the form, on the idiosyncrasies the particular direction, of the virus. That syphilis can only be cured by the elimination of the virus by nature's power, but that it is the province and within the scope of art to aid and promote her salutary efforts. And, lastly, that all so-called specifics are powerless to modify, counteract, or destroy the specific properties of the virus, but are all powerful when directed against the accidents due to its special action on the tissues."—(*Lancet.*)

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"*Tetrachloride of Carbon as an Anæsthetic.* By PROTHEROE SMITH, M.D., Physician to the Hospital for Women.—The tetrachloride, or, as it used to be called, the bichloride, of carbon,* is the highest of a series of chlorides of four grades.

"Of the numerous methods of preparing the tetrachloride of carbon, that devised at the Royal Institution by Messrs. Frankland and Duppa appears to be the simplest and most economical. The following is a brief outline of the process:

"A Woulfe's bottle is filled to rather less than one-fourth of its capacity with bisulphide of carbon, to which has been added either a little sulphur, or, what is better, bichloride of sulphur; one per cent. of either of the above substances will suffice. A stream of perfectly dry chlorine is now passed through the mixture, and continued until no further absorption takes place; this occurs when the liquid has increased to about four times its original volume. As the liquid in the bottle becomes very hot during the process, means for keeping it cool must be resorted to.

"The brownish-red liquid produced now consists of tetrachloride of carbon and tetrachloride of sulphur saturated with uncombined chlorine. Were water simply added to this liquid a large deposit of sulphur would take place, hydrochloric acid, sulphurous acid, and sulphuretted hydrogen being procured at the expense of the tetrachloride of sulphur, and a large quantity of tetrachloride of carbon set free; but as tetrachloride of sulphur, when brought into contact with bisulphide of carbon, is found to yield tetrachloride of carbon and bichloride of sulphur, advantage of this reaction is taken, and a certain quantity of bisulphide in small portions is gradually added, and the whole submitted to distillation.† After

* Sir James Simpson has concisely termed it "chlorocarbon."

† Care must be taken in making this addition, as the reaction, which at first is barely perceptible, after a time becomes very violent and totally unmanageable. The mixture is best distilled twelve hours after the addition of the bisulphide.

three or four rectifications the liquid separates into two portions, one consisting of tetrachloride of carbon, containing a little bichloride of sulphur, and the other of bichloride of sulphur containing a little tetrachloride of carbon. The impure tetrachloride is now treated with water and milk of lime distilled, when the substance nearly pure distils over with a little water: a rectification or two *per se* will suffice to obtain it in a state of absolute purity.

"Messrs. Hopkins and Williams, of New Cavendish Street, who have succeeded in producing a very pure specimen of the tetrachloride of carbon according to the above described process, have found that, before its final washing, the addition of a little ammonia very much improves its character, and helps to deprive it of the last traces of bisulphide of carbon and chloride of sulphur.

"A specimen having been obtained from the laboratory of the Royal Institution, about half a drachm on a handkerchief was inhaled. Its vapor was found to be agreeable, having a delicate perfume not unlike that of quince, and imparting at first a sensation of coolness to the throat, similar to that experienced in drawing in one's breath after taking peppermint, followed by a feeling of warmth on the surface of the body generally. This was succeeded by a feeling of calmness and freedom from the exhaustion which had previously been felt, and which did not return during the remainder of the day; and sleep that night was more sound than usual. The experiment was repeated on the following day, with similar results. On March 23d, having obtained a perfectly pure specimen of the fluid, twenty minims on a handkerchief were inhaled, repeating the dose when it had evaporated. Its anæsthetic effects were very rapid, preceded by an agreeable sense of drowsiness, etc., and other sensations similar to those which I had experienced from chloroform, but in a less degree, and giving place in about two minutes to calm sleep, after which scarcely a minute elapsed before the return of complete consciousness. Sleep was again calm and undisturbed through the succeeding night. With the assistance of Dr. Heywood Smith its effect on insects and some of the lower animals was tried. In the case of insects it was found that whereas chloroform, when dropped on their heads, was quickly fatal, they soon recovered when the tetrachloride in like manner was employed. Its effect in comparison with chloroform was afterward observed on four guinea-pigs.

"Although it is shown by the foregoing experiments that tetrachloride of carbon is a powerful anæsthetic, yet consciousness is rapidly restored after its use, notwithstanding the heaviness of its vapor, when it is administered in moderate quantities. When pushed, however, to extremes, it seems to destroy life by causing arrest of the circulation of blood through the lungs, a distended condition of the right side of the heart, an insufficient supply of blood to the left side of the heart, and a consequently diminished systemic circulation."—(*Ibid.*)

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"*New Anæsthetic.*—We are glad to announce the introduction of a new anæsthetic, which, if further experience confirms the results hitherto obtained, promises to be of remarkable value. Dr. Protheroe Smith has been making some observations on the administration by inhalation of the tetrachloride of carbon (CCl_4), of which we wait for a fuller account. In the mean time, from our own observation, we may state in favor of this agent, that it has a pleasant odor, somewhat resembling that of the quince.

We understand that anæsthesia is rapidly produced by it (in some cases in the space of half a minute), that the condition appears to be easily sustained with or without entire loss of consciousness, and that the effects pass off very quickly. There is not usually, we learn, any excitement or struggling before anæsthesia supervenes, and its use is not followed by the sickness which is sometimes so troublesome a feature from the administration of chloroform. A point of great interest in relation to the tetrachloride of carbon is the property which we are told it possesses of immediately allaying pain arising from any cause. In a large number of instances it has been successfully employed for the relief of headache and dysmenorrhœal suffering. Dr. Protheroe Smith has found it of great value in inducing quiet and refreshing sleep. He has also employed it in midwifery, and finds that it removes pain without necessarily destroying consciousness or interfering apparently with the expulsive efforts of labor."—(*Ibid.*)

Local Anæsthesia by Cold.—Dr. James Arnott says (*Med. Times and Gaz.*) "nothing can be more easy than to dip a bit of ice into common salt and press it gently on the skin, and yet this is sufficient to freeze it in less than the quarter of a minute. In some cases, indeed, a frigorific mixture cannot be properly applied without a cup or vessel of peculiar shape to contain it, which unquestionably involves more trouble than the projection of ether; but in several situations the part cannot be congealed by ether, and it is necessary to use either a freezing mixture, or a metallic ball or oval which has been cooled to the requisite degree by immersion in it. When deep, extensive, and long-continued congelation is required, or when it has to be used when inflammation is present, either in operations or in the treatment of disease, congelation by a freezing mixture, which can be combined with pressure and applied to any extent of surface, is the only measure which will fulfill the purpose. Simplicity and facility of application are doubtless valuable properties, but efficiency must not be sacrificed to ease."

"*Sloughing produced by Local Anæsthesia.*—We examined, a few days since, in the Middlesex Hospital, a young woman whose case is of no little importance in reference to the question of local as against general anæsthesia for operations. Mr. Lawson had diagnosed the existence of an abscess behind the patient's breast, and as the pus was very deep (under the pectoral muscle indeed) the refrigerator was used, paraffine ether being employed. Congelation was rapidly produced, and kept up for a few minutes. The result has been, that a portion of skin, about an inch by three-quarters of an inch, over the upper part of the breast, has sloughed, and its healing will necessarily be attended by an unseemly scar. The patient is a maid-servant; were she unfortunately a lady, the undress of the modern ball-room would be impracticable without revealing such a blemish as might seriously damage her value in the matrimonial market. The case is certainly exceptional; but the circumstance is worth remembering when exposed parts of the body are to be operated upon."—(*Lancet.*)

"*Abscess from a Carious Tooth Pointing in the Temporal Region and Through the Orbit.* Reported by E. Williams, M.D.—J. D., a stout German, 49 years old, came to see me on the 6th inst. with the following history:

"Three weeks before he was attacked with severe toothache in a superior molar of the left side. His face was much swollen and the pain so great that four days afterward he went to a *barber* to have it extracted. The *barber*-ous operation was tedious, awkward, and painful. The swelling of the face increased, and he suffered excruciating pain for a week, when an abscess opened at the lower and outer margin of the orbit, just below the external commissure of the eyelids.

"When I examined him for the first time there was marked exophthalmus of the left eye, with serous chemosis, but no impairment of vision, and but slight limitation in rotation outward, the movements in all other directions being perfect. As stated, just at the edge of the orbit, a little below the palpebral ligament, was a fistulous opening surrounded by flabby granulations, from which pus escaped when he worked the lower jaw. The whole corresponding side of the face was much swollen, but especially the region over the upper part of the temporal muscle. By firm pressure there, above the zygomatic arch, pus escaped freely into his mouth, and slightly through the fistula at the corner of the eye. A probe entered in between the cheek, the alveolar process corresponding to the extracted tooth, was made to pass up under the zygomatic arch and to the extreme upper expansion of the temporal muscle from whence I had pressed the pus. Then again, I passed the probe through the fistula at the outer edge of the orbit, down through the spheno-maxillary fissure, into the zygomatic fossa, where it communicated with the passage first explored. There was much difficulty in opening the mouth even half an inch, and efforts at mastication were attended by pain and escape of pus through the fistula of the orbit. The pus had evidently extended under the zygoma, along the temporal muscle, and prevented by its firm sheath and the fascia from opening in region of the temple; had burrowed through the spheno-maxillary fissure into the outer and inferior part of the orbit, whence it made its escape by the spontaneous opening already described.

"The diagnosis was perfectly clear and certain, and the course of the pus readily explained by the anatomical relations in this region. I made two incisions in the temporal region so as to give exit to the pus there, kept it well pressed out by dressing twice a day, and the patient is slowly recovering. But little matter escapes from the eye, the mouth or the temple. The eye is receding in the orbit, the swelling of the skin and conjunctiva abating, and, in short, the case is progressing toward a favorable termination. Some stiffness of the jaw, pain on chewing, and escape of matter constitute the only inconveniences at present. They will eventually cease."—(*Cincinnati Lancet and Observer.*)

"*A New Form of Suture.* By Albert H. Hoy, M.D., of Racine, Wisconsin.—While serving on the Medical Staff of the U. S. Army, during the late war, we repeatedly used a suture to which, not knowing of its being mentioned in any treatise on surgery, we desire to call the attention of the profession, trusting that they will find that it meets the indications of a good suture, *viz.:*

"1st. Adaptation of the edges of the wound.

"2d. Producing little irritation.

"3d. Easily applied.

"We term it the *Rubber Suture*, and in using it, the following things are required:

"1st. A paper of ladies' sewing needles, the points of which, for one-

third of their length, have been heated in a lamp and curved, like a surgeon's needle. No. 4 is the best size.

"2d. Some pure rubber elastic bands, cut into inch lengths. That having a width of one-tenth of an inch will be found most generally useful.

"3d. A pair of small pliers and wire-cutters.

"The suture is introduced in the following manner: One of the needles is taken firmly by the eye with the pliers, and a piece of the rubber band is strung on, near one of its ends: the needle, thus armed, is thrust through the edges of the wound, holding them together; the free end of the rubber band is then strung over the point of the needle, care being taken to give the band just sufficient tension to hold the lips of the wound snugly together; the points of the needles are then snipped off with the cutters, and the suture is complete.

"In place of the rubber bands, what is known as the French rubber tubing, for dental purposes, is in some cases preferable. Sections of this, of size in accordance with the tension required, may be looped over the ends of the needles after they are introduced, by means of the artery forceps.

"It may not be out of place to remark, that we have seen numerous instances of what might be properly termed union by the first intention, in cases where this suture was used, and these, too, in the most extensive wounds. The elasticity of the rubber tends constantly to keep the lips of the wound in direct apposition, even though the needles may be loosened by suppuration, and it is well known that steel or iron produces a very trifling amount of irritation. The rubber, also, is not affected by the heat or secretions of the part.

"We were led, just now, to call attention to this suture, from the fact that a few days ago we assisted Dr. P. R. Hoy, of this city, in removing nearly the entire under lip of a gentleman, for an epithelial cancer, and succeeded, after loosening the integuments from the lower jaw, in bringing the lips of the wound together, and retaining them perfectly successfully until union took place, by means of this rubber suture. We desire to recommend it strongly in hare-lip and other plastic operations, where a speedy union of cut surfaces is of the greatest importance."—(*Chicago Med. Journ.*)

"*Perchloride of Iron with Collodion as a Hæmostatic.*—The *Antwerp Journal* states that perchloride of iron combined with collodion is a good hæmostatic in the case of wounds, the bite of leeches, etc. To prepare it, one part of crystallized perchloride of iron is mixed with six parts of collodion. The perchloride of iron should be added gradually and with care, otherwise such a quantity of heat will be generated as to cause the collodion to boil. The composition when well made is of a yellowish-red color, perfectly limpid, and produces on the skin a yellow pellicle, which retains great elasticity."—(*Confederate States Med. and Surg. Journal* and *Nashville Jour. of Med. and Surg.*)

Removal of Nitrate of Silver Stains.—According to a writer in the *Medical Press and Circular*, "by the combination of tincture of iodine and a solution of hyposulphite of soda (called the 'iodine process'), the ink-like stains of nitrate of silver may be eradicated. Chemically, the hyposulphite of soda neutralizes iodine; whether medically it has the same effect, is a question."

"*Thermoterion or Economic Heat-retainer.*—This is the name given to a piece of apparatus which will be found exceedingly useful in laboratories. It consists of a series of concentric metallic or other vessels, the inner one containing a readily removable glass beaker; outside this is a space for hot water, which is supplied through a covered opening, and it is the heat from this water which keeps anything warm which may be placed in the glass beaker. Outside the hot-water space is an air-jacket which insulates the hot water and obstructs the radiation of its heat. Air, being a non-conductor of heat, enables a high temperature to be maintained within the apparatus for many hours. As an experiment, boiling water was poured into the beaker and hot-water space, and the temperature of liquid in the beaker was taken every hour. At the end of the first hour it was 186° F.; second hour, 171°; third, 159°; fourth, 149°; fifth, 141°; sixth, 133°; seventh, 126°; eighth, 119°; ninth, 113°; tenth, 108°. Chemists engaged in research, or wishing to prepare good crystals of any compound by very slow cooling, will appreciate the advantage of an apparatus of this character, which enables the crystallizing operation to be prolonged for so many hours. It will be equally convenient when digestions, solutions, or pressure-tube operations are required to be conducted, and where an actual boiling temperature is not needed."—(*Drug. Cir.*)

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"*Test Objects for the Microscope.*—To such wonderful perfection has this process been carried, that M. Nobert, of Griefswald, in Prussia, has engraved lines upon glass so close together, that upwards of eighty thousand would go in the space of an English inch. Several series of these lines were engraved upon one slip of glass. By these the defining power of any object-glass could be ascertained. As test objects, they are equal to, and even rival, many natural objects which have hitherto been employed for this purpose. The delicate lines on some of the diatomaceæ are separated from each other by the 1-50,000th of an inch, while the finest lines engraved by M. Nobert are not more than the 1-100,000th of an inch apart.

"The Podura scale is a most excellent test object. According to Prof. J. W. Bailey, the diatoms *Grammatophora subtillissima* and *Hyalodiscus subtilis* are the most delicate tests."—(Beale, *American Naturalist.*)

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"*Diatoms.*—These beautiful objects for the microscope are minute silicious plants, which from their ability to move about independently in the water, and from being supposed to have stomachs, were for a long while thought to be animals, and placed among the Infusoria. Their hard silicious shells are characterized by being marked with fine delicate lines or rows of dots. They are found in all our waters, whether salt, brackish, or fresh. Their hard shells are preserved under bogs, where they form layers, resembling fine white silicious sand, and also in guano. They also occur fossil at Bermuda, Oran in Algeria, and Richmond, Va."—(*Ibid.*)

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"*Cutting Glass under Water with a Pair of Scissors.* By Nelson K. Cherrill.—It is often very convenient to have a ready means of cutting glass to shapes not easily obtained by means of the diamond. Many are not, I think, aware of the fact that glass can be cut under

water with great ease, to almost any shape, by simply using a pair of ordinary 'nail' or other strong scissors. In order to insure success, two points must be attended to: first, and most important, the glass must be quite level while the scissors are applied; and second, to avoid risk, it is better to begin the cutting by taking off small pieces at the corners and along the edges, and so reduce the shape gradually to that required, as if any attempt is made to cut the glass all at once to the shape, as we should cut a piece of card-board, it will most likely break just where it is not wanted. Some kinds of glass cut much better than others; as far as I know, the softer glasses cut best. The scissors need not be at all sharp, as their action does not depend much upon the state of the edge presented to the glass. When the operation goes on well, the glass breaks away from the scissors in small pieces in a straight line with the blades.

"This method has often proved very useful to me in cutting ovals, etc., which would be very expensive if ground cut; and though the edges are not so smooth as may be desired for some purposes, the method is, I think, worth knowing. The two hints above given always secures success in my hands."—(*Photo. News* and *Drug. Cir.*)

Drilling Glass.—The following process for this purpose is given (*Amer. Artisan*) by a correspondent of the *Chem News:* "Some years ago I read in a German periodical of a new means for drilling glass—viz., dilute sulphuric acid—and I found it, on trial, to answer much better than oil of turpentine. Not only is the efficacy of the cutting tool increased more by sulphuric acid than by the oil of turpentine, but also the tools (files, drills, etc.) are far less rapidly destroyed by being used with the acid than with the oil. I also found it stated that, in the engineering establishment of Mr. Pintus, at Berlin, glass castings for pump barrels, etc. were drilled, planed, and bored just like iron ones, and in the same lathes and machines, by the aid of sulphuric acid. As to drilling, I can fully testify to the efficacy of that method. Whenever I want, say a hole in the side of a bottle, I send it, along with some dilute (1·5) sulphuric acid, to the blacksmith, who drills in it, with a hand brace, a hole of $\frac{1}{4}$ inch diameter. This hole is then widened to the required size by means of a triangular or round file again wetted with the acid. I also find a great help in the latter when making graduations on litre flasks, etc. There is hardly any smell perceptible during the work, which proves how little the acid acts upon the tools, undoubtedly owing to their being tempered; but each time after use I take the precaution to wash and dry the files at once, and I have so far observed no sensible deterioration in them."

"*Sharpening Files.*—J. S. C., of New York City, says that when files become clogged and dulled they should be bathed in strong potash water to remove all grease, and then immersed endwise in a jar of one gallon soft water, two ounces tartaric acid, and half a pint of sulphuric acid. Let them remain a few hours, remove them, and after washing in clear water put a little oil on the teeth. A second immersion in the acid before oiling and after washing is sometimes an advantage. The acid etches the teeth, or rather the interstices, and sharpens the file. We have heard of this before, but have never tried it."—(*Sci. Amer.*)

"*Art of Grinding Tools.*—More than one-half of all the wear and tear and breakage and bother of dull tools comes from a lack of proper knowledge and practice in grinding. All steel, however highly refined, is composed of individual fibres laid lengthways in the bar, held firmly together by cohesion; and in almost all farm implements of the cutting kind the steel portion which forms the edge, if from a section of a bar, is laid in and welded to the iron longitudinally, so that it is the side of the bundle of fibres hammered and ground down that forms the edge. Hence, by holding on the grindstone all edge-tools, as axes, drawing-knives, knives of reapers, scythes, knives of straw-cutters, etc., in such a manner that the action of the stone is at right angles with the plane of the edge, or, in plainer words, by holding the edge of the tools square across the stone, the direction of the fibres will be changed, so as to present the ends instead of the side as a cutting-edge; by grinding in this manner a finer, smoother edge is set, the tool is ground in less time, holds an edge a great deal longer, and is far less liable to 'nick out' and break."—(*Germantown* (*Pa.*) *Telegraph.*)

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"*Iridium.*—Iridium is a very brittle, hard, white metal, the most refractory of all the metals; it is fusible only by the oxyhydrogen blow-pipe and the voltaic current. It is found in the ore of platinum and in a native alloy with osmium; in alloy with the latter it is of a steel-gray color and of a shining metallic lustre. When thus alloyed it is called *iridosmine* and is used for nibs in pointing gold pens.

"The name 'Iridium' is derived from the Latin name *Iris*, the rain-bow, on account of the beautiful colors exhibited while dissolving in muriatic acid. Iridium is the heaviest substance known, which, bulk for bulk, weighs twenty-three times as much as water. It unites with tin and lead at a bright red heat and forms a white slightly malleable alloy; with copper, a reddish-white alloy, which is malleable; with gold, an alloy yellow and ductile; with equal weight of platinum, a brittle but weldable alloy; with ten parts platinum, a malleable alloy; with silver it forms a perfectly malleable compound, the iridium having the appearance of being diffused through the silver in fine powder. If gold and silver be dissolved, the iridium is left as a black powder. Lead may be separated by cupellation from it, leaving the iridium in the cupel similar to the form in which it is left when gold or silver is dissolved from it. When heated in the flame of a spirit-lamp it combines with carbon, acquiring a covering of soot, which, when burned, leaves a kind of skeleton of spongy metal."—(*American Artisan.*)

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"*Welding Metals.*—The following is brought forward by Mr. BERNARD LIETAR, of Brussels, as 'an improved method of welding iron upon iron, steel upon steel, and iron upon steel:' '1 kilogramme of filings of iron or steel; 100 grammes of salt of ammonia; 60 grammes of borax; 50 grammes of balsam of copaiba. Calcine the whole and reduce to fine powder. For an ordinary solder one of the pieces of iron or steel is heated to a red heat, and after the part to be soldered has been carefully cleaned with a file or wire brush, the above composition is spread upon it, and the second piece at a white heat is immediately placed upon it and welded together.'"—(*Ibid.*)

Transparency of Red-hot Metals.—A. Adriani calls attention, in the *Chemical News*, "to a curious fact observed and communicated by the reverend and highly eminent *savant*, Father Secchi, of Rome, concerning the transparency of iron while red hot. The fact that iron, steel, and also platinum and copper, are transparent while at a bright red heat, has been known long since not only to practical engineers, but, as regards iron, steel, copper, and platinum, to workers in these metals. The account given of the manner in which the excellent member of an eminent society found out this property of iron is as follows: The reverend Father had ordered a strong iron tube to be made. As it was intended for an apparatus requiring a vacuum, it was essential that this tube should be perfectly air-tight; and as Father Secchi had some doubts about its soundness in this respect, in order to set these at rest the tube was made red hot and taken into a dark place, when Father Secchi clearly perceived through the iron, which was half a centimetre thick, a crack inside the tube, and which did not reach to the outer surface. It is rather curious that the fact of the metals above alluded to, to which I have reason to believe that gold may be added, becoming transparent at red heat, should have escaped the notice of scientific men. It requires, however, a good bright red heat; but the transparency of the metals is evident thus even in daylight, as I know from my own experience while working in an engineering establishment attached to a large sugar refinery, now many years ago."

"*Estimation of Silver in a Metallic State.*—According to M. Classen, silver is wholly precipitated by cadmium; when dealing with a nitric solution of silver, evaporate to dryness in the presence of sulphuric acid, dissolve the sulphate of silver in boiling water, plunge into it a plate of cadmium, and the reduction of the silver takes place at once. The silver is deposited in a compact mass, easily washed with water; as it may contain a little cadmium, boil it in the acid liquid until no hydrogen escapes; wash it until the water contains no sulphuric acid; then dry, and calcine; the silver, at first a black gray, takes the metallic lustre; it may then be weighed;—the results are very exact."—(*Chemical News.*)

"*Adulterated Tin Foil.*—As tin foil is employed for so many purposes in connection with substances of personal and domestic consumption, reliable information respecting its nature and composition is of very general importance. Such information has lately been communicated to the *Pharmaceutical Journal* by Dr. J. H. Baldock. He found, by chemical analysis, that common foil contained 86·93 per cent. of lead, embossed foil 76 57 per cent., tea foil 88·66 per cent., and that which was sold for the pure article 34·62 per cent. Tin foil is usually made by inclosing an ingot of lead between two ingots of tin, and rolling them out into foil, thus having the tin on the outside and the lead in the interior."—(*Journ of Applied Chemistry.*)

"*Cement.*—Alum and plaster of Paris well mixed together with water, and used in the liquid state, will form a very useful cement. It will be found handy in the laboratory for many purposes. It forms a very hard composition, and for fixing the brasses, etc. on paraffin lamps nothing could be better."—(*Chem. News.*)